









A MONOGRAPH  
OF THE  
CULICIDAE  
OR  
MOSQUITOES.

MAINLY COMPILED FROM THE COLLECTIONS RECEIVED AT  
THE BRITISH MUSEUM  
FROM VARIOUS PARTS OF THE WORLD  
IN CONNECTION WITH  
THE INVESTIGATION INTO THE CAUSE OF MALARIA  
CONDUCTED BY THE COLONIAL OFFICE  
AND THE ROYAL SOCIETY.

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VOL. II.

LONDON:

PRINTED BY ORDER OF THE TRUSTEES.

SOLD BY

LONGMANS & Co., 39, PATERNOSTER ROW, E.C.; B. QUARITCH, 15,  
PICCADILLY, W.; DULAU & Co., 87, SOHO SQUARE, W.; KEGAN PAUL,  
TRENCH, TRÜBNER & Co., CHANCERY CROSS ROAD, W.C.;

AND AT THE

BRITISH MUSEUM (NATURAL HISTORY), CROMWELL ROAD, S.W.

1901.

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CS-89



595.733

B 862 mT

(Vol-2)

LONDON :

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED.

DUKE STREET, STAMFORD STREET., S.E., AND 28, GREAT WINDMILL STREET,

19004

## PREFACE TO VOL. II

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THIS volume deals with the rest of the genus *Culex* and with the remaining genera *Panoplites*, *Taeniorhynchus*, *Deinocerites*, *Aedes*, *Aedeomyia*, *Uranotaenia*, *Haemagogus*, *Wyeomyia*, *Trichoprosopon* and *Corethra* and *Mochlonyx*.

The two genera *Corethra* and *Mochlonyx* are doubtful *Culicidae*. They present so many differences from true *Culicidae* that I feel sure from the limited material at my disposal that they should be excluded. The peculiarities in larva, pupa and adult are, I think, sufficient to raise them to a distinct family between the *Culicidae* and *Chironomidae*. But as I have not had either sufficient time or material to properly study them, they are retained *pro tem.* in this family.

A number of new genera are described here; of these *Panoplites*, *Deinocerites*, *Aedeomyia* and *Trichoprosopon* are very distinct, and in the Appendix the same may be said of the genera *Brachiomyia* and *Limatus*. A large amount of fresh material has been received since the first volume went to press, the most interesting being that brought back by Dr. Durham from Para. Amongst his collection were the ♂'s and ♀'s of two species of *Sabethes*, one being new. From these specimens I have had to remodel the genus, as I find they are of *Aedes* type, not *Culex*, ♂ and ♀ having short palpi. The metanotum has also chaetae as in the genus *Wyeomyia*, in fact the ♀'s described in the genus *Wyeomyia* very nearly approach the female *Sabethes*. I think, however, they are distinct, but unfortunately no male *Wyeomias* have been received of any of the species. Of the two new genera described in the Appendix, one, *Brachiomyia*, is very marked, the antennae being very long and scaled; the other, *Limatus*, approaches *Trichoprosopon* on account of the metanotum having scales as well as chaetae. A number of larvae have also been recently received, including those of *Megarhinus*.

Some one hundred odd new species still remain in the collection to be described; these and new material that continues to arrive will be described in a third volume, which it is hoped will be produced next year. In the meanwhile I trust correspondents will try and obtain the two sexes of the genera *Wyeomyia*, *Brachomyia* and *Limatus*.

In a future volume the still unwieldy genus *Culex* will be further reduced, as several species retained in it must be excluded on account of scale structure, notably *Culex atratus* and its allies, *Culex dorsalis*, *Culex sollicitans* and several others.

I take this opportunity of again thanking various correspondents in all parts of the world for the great trouble they have taken in collecting material and in helping in every way in what has proved a much more arduous task than was anticipated.

FRED. V. THEOBALD

BRITISH MUSEUM (Nat. Hist.).  
September 1st, 1901.

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## FIG.

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# A MONOGRAPH OF THE CULICIDAE OF THE WORLD.

## SUB-FAMILY **CULICINA**---*continued*.

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### GENUS **CULEX**---*continued*.

#### 53. LEGS WITH TARSI APICALLY BANDED.

A single species only occurs in this group.

#### 51. **CULEX CAMPTORHYNCHUS**. Thomson.

(Eugen. Resa. Dipt. p. 443.)

"Thorax fuscous brown; pleurae lighter; mesothorax marbled with short fulvous-golden scale-like hairs, and sparsely clothed with long erect fuscous hairs on the sides and near the wings; abdomen fuscous, with the sides pale. Legs long, light coloured; tarsi with the joints apically whitish, the first (*i.e.*, metatarsus?) almost as long as the tibia.

*Habitat*.—Sydney, Australia.

*Length*.—4 mm."

NOTE.—I have not come across any Australian species with the legs apically banded. Skuse places this species as synonymous with *C. alboannulatus*, Macq., but Thomson's description does not apply exactly to *C. alboannulatus*. No mention is made of abdominal banding, nor white banding on the ♀ palpi, so that I prefer to look upon it as a distinct species for the present.

## 355. LEGS BASALLY AND APICALLY BANDED.

## LEGS BASALLY AND APICALLY BANDED.

## A. Abdomen not banded, but with pale basal patches.

Abdomen with white lateral basal patches,  
ungues of ♀ equal, the fore and mid uni-  
serrated, hind simple ..... *Canadensis*. n. sp.

Abdomen with curved median basal patches,  
almost bands; unguis of ♀ equal and simple ..... *cingulatus*. Fabri-  
cius.

## B. Abdomen with basal pale bands.

Thorax deep brown, with narrow bronzy scales,  
with a median and two short parallel, lateral,  
indistinct lines of creamy scales; brighter  
brown in the ♂, with golden-scaled lines;  
ungues of ♀ equal, fore and mid unserrated;  
hind simple ..... *morsitans*. n. sp.

Thorax with pale brassy tomentum and two  
ill-marked dark long lines; apical tarsal  
joint white. .... *leucacanthus*. Loew.

Thorax with golden-yellow scales, unadorned;  
abdominal bands straw-coloured, narrow in  
the middle, expanding laterally with tri-  
angular spots; unguis of ♀ equal and  
simple. .... *pulcritarsis*. Rond-  
ani.

## C. Abdomen with basal and apical bands and a median pale line.

Thorax with a broad line of creamy scales on  
each side; abdomen black, with basal, apical  
and median yellow scales; unguis of ♀  
equal; fore and mid unserrated, hind simple;  
palpi of ♂ with three white bands. .... *pulcripalpis*. Rond-  
ani.

Thorax brown, with tawny curved scales and  
two lines of creamy ones, a patch before the  
scutellum, and a line in front; abdomen  
much as in former species; unguis of ♀  
equal and unserrated ..... *dorsalis*. Meigen.

Very like above (*dorsalis*), probably the same;  
the ♀ unguis are unserrated; palpi of the  
♂ not annulated ..... *penicillaris*. Rond-  
ani.

## D. Abdomen with basal creamy-white bands and pale lateral spots; thorax ornamented with frosty-white scales on the front two-thirds, black on the remainder

..... *gelidus*. n. sp.

52. *CULEX CANADENSIS*. n. sp.

(Figs. 82 and 83, Pl. XXI.)

Thorax deep chestnut-brown, with curved golden-brown scales, paler and broader ones at the sides. Abdomen dusky black, with basal white lateral patches, which show on the dorsum of the fourth to seventh segments. Fore and mid unguis of the ♀ equal and serrated, the hind equal, simple and nearly straight.

♀. Head dark brown, covered with pale golden curved scales, with a few black and ochraceous upright forked ones, and a border of pale scales round the eyes, black bristles projecting forwards, and a tuft of pale golden ones between the eyes; antennae black with narrow pale bands and pale pubescence; basal joint and basal half of the second testaceous; proboscis, palpi and clypeus very dark brown.

Thorax brown to deep dull purplish-brown under the lens, deep chestnut-brown to the naked eye, covered with curved golden-brown scales on the dorsum of the mesonotum and with rather broader and paler ones at the sides; scutellum deep purplish-brown, with pale narrow curved scales and a single row of golden-brown bristles to the mid lobe of the scutellum; metanotum chestnut-brown; pleurae purplish-brown, with several patches of white scales.

Abdomen covered with dusky black scales, each segment with short pale golden posterior bristles, the segments with basal

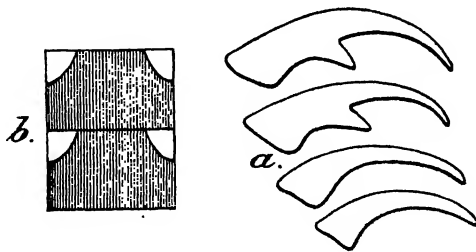


Fig. 152.

*Culex Canadensis*. n. sp.

a, Female unguis; b, abdominal ornamentation.

white lateral patches, which show on the dorsum of the fourth to seventh segments; venter entirely covered with pale ochraceous scales.

## 335. LEGS BASALLY AND APICALLY BANDED.

## LEGS BASALLY AND APICALLY BANDED.

- A. Abdomen not banded, but with pale basal patches.  
 Abdomen with white lateral basal patches,  
 unguis of ♀ equal, the fore and mid uniserrated, hind simple ..... *Canadensis*. n. sp.  
 Abdomen with curved median basal patches,  
 almost bands; unguis of ♀ equal and simple ..... *cingulatus*. Fabricius.
- B. Abdomen with basal pale bands.  
 Thorax deep brown, with narrow bronzy scales,  
 with a median and two short parallel, lateral,  
 indistinct lines of creamy scales; brighter  
 brown in the ♂, with golden-scaled lines;  
 unguis of ♀ equal, fore and mid uniserrated;  
 hind simple ..... *morsitans*. n. sp.  
 Thorax with pale brassy tomentum and two  
 ill-marked dark long lines; apical tarsal  
 joint white ..... *leucacanthus*. Loew.  
 Thorax with golden-yellow scales, unadorned;  
 abdominal bands straw-coloured, narrow in  
 the middle, expanding laterally with tri-  
 angular spots; unguis of ♀ equal and  
 simple ..... *pulcritarsis*. Rondani.
- C. Abdomen with basal and apical bands and a median  
 pale line.  
 Thorax with a broad line of creamy scales on  
 each side; abdomen black, with basal, apical  
 and median yellow scales; unguis of ♀  
 equal; fore and mid uniserrated, hind simple;  
 palpi of ♂ with three white bands ..... *pulcrispalpis*. Rondani.  
 Thorax brown, with tawny curved scales and  
 two lines of creamy ones, a patch before the  
 scutellum, and a line in front; abdomen  
 much as in former species; unguis of ♀  
 equal and uniserrated ..... *dorsalis*. Meigen.  
 Very like above (*dorsalis*), probably the same;  
 the ♀ unguis are uniserrated; palpi of the  
 ♂ not annulated ..... *penicillaris*. Rondani.
- D. Abdomen with basal creamy-white bands and pale  
 lateral spots; thorax ornamented with frosty-  
 white scales on the front two-thirds, black on  
 the remainder ..... *gelidus*. n. sp.

52. *CULEX CANADENSIS*. n. sp.

(Figs. 82 and 83, Pl. XXI.)

Thorax deep chestnut-brown, with curved golden-brown scales, paler and broader ones at the sides. Abdomen dusky black, with basal white lateral patches, which show on the dorsum of the fourth to seventh segments. Fore and mid unguis of the ♀ equal and serrated, the hind equal, simple and nearly straight.

♀. Head dark brown, covered with pale golden curved scales, with a few black and ochraceous upright forked ones, and a border of pale scales round the eyes, black bristles projecting forwards, and a tuft of pale golden ones between the eyes; antennae black with narrow pale bands and pale pubescence; basal joint and basal half of the second testaceous; proboscis, palpi and clypeus very dark brown.

Thorax brown to deep dull purplish-brown under the lens, deep chestnut-brown to the naked eye, covered with curved golden-brown scales on the dorsum of the mesonotum and with rather broader and paler ones at the sides; scutellum deep purplish-brown, with pale narrow curved scales and a single row of golden-brown bristles to the mid lobe of the scutellum; metanotum chestnut-brown; pleurae purplish-brown, with several patches of white scales.

Abdomen covered with dusky black scales, each segment with short pale golden posterior bristles, the segments with basal

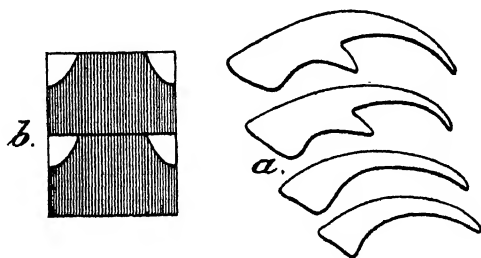


Fig. 152.

*Culex Canadensis*. n. sp.

a, Female unguis; b, abdominal ornamentation.

white lateral patches, which show on the dorsum of the fourth to seventh segments; venter entirely covered with pale ochraceous scales.

Legs with the coxae pale ochraceous, also the bases and under-sides of the femora, which are blackish towards the apical end, extreme apex pure white; tibiae black scaled above, ochraceous below; the mid and hind pair have the apex with yellow and white scales forming a small spot; fore metatarsus and tarsi uniformly dark bronze colour; mid metatarsus with a pale dusky yellow band at the base and apex, first joint of mid tarsus with a narrow basal dusky yellow band, remainder dark bronzy brown; hind metatarsi not nearly as long as the tibiae, pale banded at each end, first and second tarsal joints pale at each end, the third all dark, the fourth pale dusky white; fore and mid claws equal, with a single tooth to each, hind ones nearly straight and simple.

Wings with the veins brown scaled, the lateral scales being rather thin and long; first sub-marginal cell a little longer and considerably narrower than the second posterior cell, its stem about two-thirds the length of the cell and equal in length to the stem of the second posterior cell; posterior cross-vein about its own length distant from the mid cross-vein.

Halteres with almost a white stem and deep black knob.

*Length*.—6 to 6·5 mm.

♂. Head black, with black upright forked scales behind and a few ochraceous ones in front and pale golden curved scales; on the sides are pure-white flat scales; antennae banded brown and white with chestnut-brown plumes; proboscis deep dull purplish-black; palpi deep brown basally, black towards the apex, the last joint but one with a basal band of white scales, hair-tufts dark brown.

Thorax deep brown, denuded; scutellum deep brown, median lobe with a single row of bristles; pleurae deep chestnut-brown, with patches of white scales.

Abdomen steely-black, with dusky brownish-black scales, the last few segments with basal white lateral patches; basal lobes of male genitalia black scaled and hairy.

Wings with the first sub-marginal cell a little longer and considerably narrower than the second posterior cell, its base a little nearer the apex of the wing than that of the second posterior, its stem not quite as long as the cell; stem of the second posterior cell equal in length to its cell; posterior cross-vein distant about twice its own length from the mid cross-vein.

*Length*.—5 mm. <sup>c</sup>

*Habitat*.—De Grassi Point, Lake Simcoe, Ontario (E. M. Walker) (66).

*Time of capture*.—June and July.

*Observations*.—A very distinct species, in which the legs are very characteristically marked, the last tarsal joint of the hind legs being entirely dull white and the banding of the legs involving both sides of the joints. The dusky scaled abdomen, with the creamy-white basal lateral patches, is also very characteristic. It can thus be easily separated from any other North American species. A single male only was received, but a good series of ♀'s. The specimens were taken in such localities as the following: "From a low wood of arbor vitae, spruce, balsam, fir, &c."; "common in rich woods and swamps"; also from dry and low woods and grass; grass and low herbs in a wood of aspen, maple, balsam, &c., according to the notes sent by the collector.

### 53. *CULEX CINGULATUS*. Fabricius.

(Syst. Antl. 36, 11, Fabricius.)

Thorax brown, covered with pale golden-brown scales, with traces of three bare longitudinal lines on the mesonotum. Abdomen brownish-black, each segment with a semicircular basal band of white scales. Ungues of ♀ small, equal, and simple.

♀. Head yellowish in the middle, a dark brown patch on each side and pure white between the dark patches and the eyes at the sides; a few black forked upright scales dotted about and dark brown bristles projecting forwards; eyes deep purplish-black; antennae brown, with slightly paler rings, basal joint and base of second joint testaceous; palpi covered with black scales; proboscis dark brown, paler at the tip, and in some lights along the basal half.

Thorax brown, covered with curved golden-brown scales, which are slightly paler towards the scutellum; in certain lights may be seen three dull, bare, longitudinal lines on the front of the mesonotum, a central row of dark bristles ending before it reaches the scutellum, and a lateral row on each side which runs through to the scutellum; scutellum pale brown, with grey curved scales, six large bristles on the central lobe and four (or five?) on each lateral lobe; metanotum chestnut-brown;



pleurae pale brown with three patches of white scales and pale hairs.

Abdomen banded, covered with deep brownish-black scales, the base of each segment with a semicircular patch of white scales; each segment bordered posteriorly with pale hairs; the first segment is very peculiar, and I am not sure if it is not due to deformity; its lateral edges are pointed, the whole segment being very narrow, dark in colour, bare except for two central patches of dusky purple scales, and clothed with numerous pale hairs, venter chiefly covered with creamy-white scales.

Legs very pale at the base; fore femora dark brown above, grey below, with a faint yellow apical spot, tibiae brown, with a small apical white spot, tarsi brown, the last joint with very pale reflections: mid legs the same, only the tibial spot seems to be

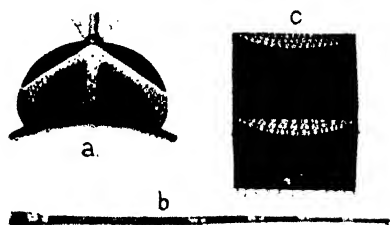


Fig. 153.

*Culic cingulatus*, Wied.

a. Head; c, two abdominal segments; and  
b, leg of a ♀.

absent; hind legs with the tibiae a little swollen and orange-yellow at the apex, a narrow pale band (involving both sides of the joints) around the junction of the metatarsus and first tarsal and the junction of all the tarsi, apex of last tarsal almost white; unguis small, equal, untoothed.

Wings iridescent, with the veins covered with long as well as short brown scales; the first sub-marginal cell much longer than the second posterior cell, about the same width, its stem very short, not more than one-fourth the length of the cell, its base much nearer the base of the wing than that of the posterior cell; posterior cross-vein about the same length as the mid cross-vein, and distant from the latter about its own length.

Halteres with grey stem and pale brown and white knob.

*Length*.—4 mm.

*Habitat*.—Rio de Janeiro (Lutz 4. 7. 1899); Lower Amazon (Austen).

•*Observations*.—Dr. Lutz sent one perfect specimen of this insect, which he calls the Small Day Mosquito. The banding of the hind legs only, and its method of banding, forms a character by which it can be told from other mosquitoes I have seen; the ornamentation of the head resembles very closely *Culex caesus*, mihi, but the leg banding differs, and there are no teeth on the ungues of the ♀ as in that species. In the single specimen sent by Dr. Lutz the first abdominal segment is very peculiar in form, but I am not sure if this is a specific character or a deformity; it looks, however, in the specimen, quite natural. This is the only South American form I have seen that in any way answers to Fabricius' *Culex cingulatus*, which it probably is. Fabricius' specimen evidently had a rubbed abdomen, hence it is described as yellowish. Arribalzaga does not mention *C. cingulatus* in his work. Other specimens are in the collection labelled Lower Amazons (Austen).

Fabricius' description of *Culex cingulatus* is as follows:—

“Brick-red, with the haustellum and hinder tarsi ringed white; of the size of *C. pipiens*, entire body brick-red. Head reddish-yellow; base of the antennae ferruginous, with silky yellowish hairs; proboscis yellowish-brown at the tip; palpi brown, the root of each joint white. Thorax bright ferruginous; pleurae yellowish; abdomen yellowish; wings and legs yellowish; tibiae with brown, variegated with white, tomentum, tarsi brown, with each joint white at the base; apex of front tarsi wanting, but base of remaining joint is white banded. About three lines (German).—S. America.”

Fabricius describes a ♂, and points out that the *hind tarsi* are white banded; the other legs seem to have been imperfect. The type is in the Royal Museum, Copenhagen.

It will at once be said that the species here described is not *C. cingulatus*, because the banding of the legs involves both sides of the joints. In some specimens the banding scarcely does so; the apical banding would pass unnoticed with a hand-lens, but can easily be seen in different degrees by microscopic examination. Faint traces of banding may sometimes be seen in *C. fatigans*, so that it is possible Fabricius' species was no other than *C. fatigans*, but more probably the one described here.

54. *CULEX MORSITANS.* n. sp.

(Fig. 79, Pl. XX.)

Thorax deep brown, with narrow curved bronzy-brown scales, with median and lateral indistinct lines of pale creamy scales. Abdomen dull dark brown, with fuscous scales and with basal creamy-yellow bands. Ungues of the ♀ equal and simple.

♀. Head deep brown, with narrow curved pale scales and black upright forked ones; antennae brown, the basal joint bright ferruginous, also the base of the second joint, narrowly pale banded, covered with pale pubescence and black verticillate hairs; palpi brown, with blackish scales, apex yellowish-white; clypeus brown; proboscis dark brown, pale near the base.

Thorax deep brown, covered with scattered narrow curved bronzy-brown scales, with median and lateral rather indistinct lines of slightly thicker creamy scales, which are also present at the sides of the mesonotum; scutellum brown, with narrow curved creamy scales and dark brown border-bristles; metanotum pale clear chestnut-brown; pleurae brown, with a few creamy scales.

Abdomen dusky brown, covered with fuscous scales and with basal creamy-yellow bands to the segments, their posterior borders edged with pale hairs; venter mostly pale yellow scaled, with fuscous patches on each side, about the middle of each segment.

Legs dark brown; coxae, bases and ventral surfaces of the femora pallid, knee spots yellow, apices of the tibiae yellow; base and apex of fore metatarsus and first tarsal narrowly banded pale yellowish, the bands thus involving both sides of the joints; in the hind legs the banding involves all the tarsal joints; unguis equal and simple.

Wings with the veins with long thin brown lateral scales and a brown fringe; both fork-cells long and about the same width, the first sub-marginal cell a little longer than the second posterior cell; base of the second posterior rather nearer the base of the wing than that of the first sub-marginal; stem of the sub-marginal about one-third of the length of the cell; stem of the posterior about as long as that of the former cell; posterior cross-vein about the same length as the mid cross-vein and rather more than its own length distant from it. Halteres with a pale stem and fuscous knob.

*Length.*— 7 mm.

• ♂. Head black, with a bare line down the centre, clothed with pale creamy curved scales on each side; flat creamy-white ones at the sides, and between these and the curved ones a somewhat brownish line; there are also very long brown upright forked ones dotted about, and golden-brown hairs projecting forwards; clypeus deep brown; antennae banded black, brown,

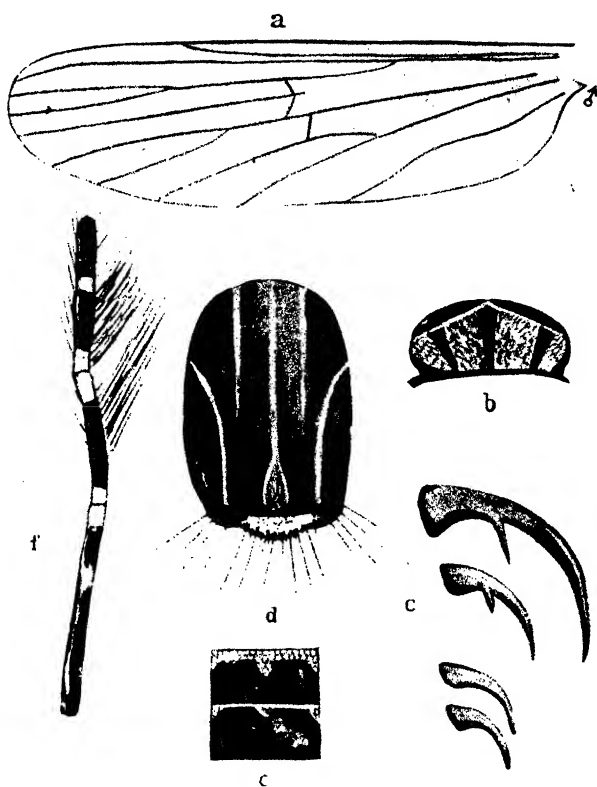


Fig. 154.

*Culex morsitans*. n. sp.

a, Wing of ♂; b, head; c, unguis of ♂; d, thoracic ornamentation of ♀; e, abdominal ornamentation; f, male palpus.

and grey, basal joint deep brown, hairs deep brown, flaxen at their base; palpi longer than the proboscis by their last joint, blackish-brown, with the bases of the last and penultimate joints with a narrow yellow band, the preceding with a broad yellow band at the apex and a narrow one at its base, and the next with a narrow apical yellow band; that is blackish-brown with four

distinct yellow bands; the last joint slightly spatulate and truncated, the penultimate and antepenultimate with brown hairs, with sometimes flaxen reflections on the latter; the palpi themselves are yellowish, the black colour being due to dark coloured scales; proboscis yellow, dark at the base and apex.

Thorax bright chestnut-brown in the middle, darker brown at the sides, ornamented with two parallel median lines of narrow curved golden scales close together, another line of golden scales on each side in front, another golden line on each side behind, bending down laterally about the middle, a bare space between the two lateral median lines on each side bright chestnut-brown; there are also golden scales dotted over the darker sides between the lateral lines and three double rows of black bristles and numerous golden-brown ones over the roots of the wings: scutellum pale ochraceous grey, with pale golden curved scales forming two tufts on the middle lobe, and eight golden-brown long bristles with intermediate small ones on the mid lobe, and seven large dark and other small brown ones to each lateral lobe: metanotum ochraceous brown, with a median dusky line; pleurae pale brown, with traces of white scales.

Abdomen steely-black, clothed with dark brown scales, each segment, except the first, with a basal band of creamy-white scales, which on the last few apical segments spread out laterally and towards the middle; posterior borders of the segments with long golden hairs and the sides with long brown hairs, ♂ genitalia with long golden hairs.

Legs with the coxae pale brown, femora at the base and beneath on the basal half grey, upper part and apex dark brown, knee spot yellow; tibiae yellow, covered with dusky brown scales, apex bright yellow, bristly; fore metatarsus and tarsi black scaled, the penultimate joint small, the last pale beneath; in the mid legs there is a narrow indistinct yellow band at the base of the metatarsus and first tarsal joint, remainder black; in the hind legs the first tarsal joint has an apical and basal narrow yellow band, the second tarsal a basal one only, also a pale band at the base of the metatarsus involving the apex of the tibia; hind metatarsus about two-thirds the length of the tibia; unguis of fore and mid legs unequal, black, the larger one with two, the smaller with one tooth; hind ones of moderate size, equal and simple.

Wings long, the veins clothed with yellowish-brown scales;

the lateral scales mostly long; first sub-marginal cell narrower but about the same length as the second posterior cell, its stem nearly as long as the cell, its base nearer the apex of the wing than the base of the second posterior cell, stem of the latter shorter than the cell and shorter than the stem of the former cell; supernumerary and mid cross-veins forming a slight obtuse angle with one another, the posterior cross-vein about two-thirds of its own length distant from the mid cross-vein; fringe brown, with pale reflections along the inner border towards the base. Halteres ochraceous-brown, with a slightly fuscous knob, stem elongated and thin.

*Length*.—6 to 7 mm.; with proboscis 11.5 mm.

*Habitat*.—England.

*Time of capture*.—June and September.

*Observations*.—I have previously taken this species to be *C. verans*, Meigen, but it can be separated from it by the fact that the unguis of the ♀ are simple, not toothed. The description is from a ♀ in Mr. Verrall's collection.

A male specimen in the British Museum I feel sure is the male of this species, resembling those in Mr. Verrall's collections. It also differs from the ♂ *verans* in having two teeth to the larger unguis on the fore and mid legs. It is certainly a new species, but closely related to *C. verans*, which I have so far been unable to find in England.

### 55. CULEX LEUCACANTHUS. Loew.

(Beschr. Europ. Dipt. Dritter Bd. Halle (1873).)

“♂. Head of a pale brassy tint; antennae with blackish hairs, with whitish reflections; palpi whitish with white reflections and also white reflections to the hairs. Thorax brassy yellow, with two ill-defined darker longitudinal streaks; pleurae spotted with snow-white; abdomen with black dorsum and basal white bands of equal size, with numerous pale yellow hairs. Legs with the femora whitish; knee spots white, the spots involving both sides of the joints; tarsi white-ringed, in the fore and mid legs on the bases and apices of the first (metatarsus) and second and on the base of the third joints, last joint white, thus making four bands; in the hind legs there are five white bands, the last joint being white, as in the fore and mid legs. Wings with the scales of the hind margin very characteristically white.

*Length*.—1 $\frac{3}{4}$  lines.

*Habitat*.—Kasan.

*Time of capture*.—June.”

*Observations.*—I have not met with this species. It is evidently very distinct, the white wing fringe being different to anything I have met with in the *Culicidae*, except in the former species, in which the fringe is very pale, one might almost say white, at the base. The ♂ only has been described. I know of no record since Loew described it, from which description this is compiled.

#### 56. *CULEX PULCRITARSIS*. Rondani.

(Sp. Ital. *Culex*, Boll. Soc. Ent. Ital. (1872), Rondani: Venti Sp. Zanzare Ital. p. 133 (1899), Ficalbi.)

“Head brown; palpi of ♀ brown, the small fourth joint brownish-black with a white apex; in the ♂ longer than the proboscis, slightly clubbed, brown, with pale rings at the base of the last three joints, hair tufts maroon-brown, pale at their apices. Antennae of the ♀ brownish-black, in the ♂ with maroon-brown plumes, with pale reflections, basal joint with white scales; a white border round the eyes. Thorax with brassy or golden tomentum, no special ornamentation; pleurae speckled white. Abdomen chocolate-brown, with straw-coloured basal bands, narrow in the middle, but expanding laterally with triangular spots with the apex behind; venter whitish. Legs with the coxae yellowish-brown, with white scales; femora yellowish-white, except at the apex and base, where they are dark-brown, with whitish specks at the base; tibiae brownish-black, except a narrow yellowish-white ring at the apex, which unites with the basal ring of the first tarsal joint (= metatarsus); tarsi brownish-black, with broad pale rings involving both sides of the joints, last joint entirely light coloured; unguis of the ♀ equal, the fore and mid unserrated, hind simple; in the ♂ the fore and probably the mid unguis are unequal, the larger claw with two and the smaller with one tooth; the hind ones are small, equal and simple. Wings with pale specks.

*Length.*—7 to 8 mm.”

*Habitat.*—Italy (Rondani and Ficalbi).

*Observations.*—I have not seen this species, but it has been recently described by Ficalbi, who has also examined Rondani's type. The above short account is taken from Ficalbi's description (Venti Sp. Zan. Ital. p. 133). It seems very closely related to the three following species.

57. *CULEX PULCRIPALPIS*. Rondani.(Specie Ital. d. Gen. *Culex*, Boll. Soc. Ent. Ital. (1872).)

(Fig. 81, Pl. XXI.)

Thorax black, with dense narrow golden-brown curved scales, with two parallel lines of creamy-white scales of similar form meeting in front of the thorax and which are broadest on the anterior half. Abdomen dark brown to black, with basal creamy bands, which spread out in the middle, forming more or less a median pale line and also more or less apical pale bands, especially to the posterior segments. Last hind tarsus white; fore and mid ungues of the ♀ equal and toothed.

♀. Head with creamy-yellow curved scales in the middle, golden-brown ones at the sides, and with numerous, creamy, upright forked ones behind, and a few upright black ones laterally, a small creamy tuft projecting between the eyes and a narrow pale border to them. Clypeus dark brown; palpi covered with deep purplish-black scales, with white scales at the apex; antennae brown, basal joint deep testaceous brown, with creamy-white scales, base of the second joint pale testaceous; proboscis greyish-white in the middle, black scaled at the base and apex, and a few black scales scattered over the white band.

Thorax black, covered with a thick felting of narrow, deep golden-brown curved scales, with two parallel lines of creamy-white scales of similar form, which meet round the front of the thorax, and which are broadest on the anterior half; scutellum brown, yellowish towards the base and on the lateral lobes, with golden-brown curved scales in the middle, white ones on the lateral lobes, mid lobe with a great number of bristles on the border, several rows deep; and also a thick tuft on the lateral lobes; metanotum olive brown; pleurae deep brown to purplish-black over the legs, with dense tufts of white scales.

Abdomen covered with deep brown to black scales, each segment with a basal band of creamy-white scales, which expands centrally in some segments half across the segment, in others right across, thus forming more or less of a median creamy line; on some segments there are also narrow, apical, creamy scales forming more or less regular apical bands, which on the last two segments are very broad, each basal segment expands laterally into a pure-white lateral spot; venter covered with creamy-white scales, dark on the posterior borders.



Legs with the coxae yellowish, with numerous white scales, and with a row of pale bristles; femora pale, creamy white at the base and beneath, with scattered dark brown scales above

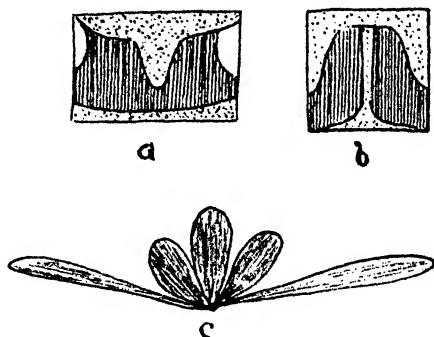


Fig. 155.

*Culex pulicripalpis*, Rondani.

a. Abdominal segment of ♀; b, segment of ♂;  
c, wing scales.

and a few below near the apex only, deep brown above just before the apex, but still with a few white scales dotted about; extreme apex pure white, forming with the base of the tibia a white knee spot; tibiae deep brownish-black, speckled with white scales, and with a white band at the apex; in the fore legs the metatarsus is short, black, with a narrow apical white band, the first tarsal joint with a white basal band, the second with a trace of basal banding, the last two with dull grey scales, except just at their apices, which are black; in another specimen the first tarsal is basally and apically pale scaled, and the last two dark; the mid legs are the same, except the first two tarsi, which are apically and basally banded, and the third basally; the hind metatarsus and first two tarsi are broadly apically and basally banded, the third tarsus basally banded, and the last pure silvery white; the legs have all the joints pale below; fore and mid unguis equal and toothed; the hind ones small, equal and simple.

Wings with the veins clothed with brown, grey, and white scales, the latter especially towards the base; veins yellowish, giving the first long vein a somewhat spotted appearance, the lateral scales long and thin; first sub-marginal cell a little longer and much narrower than the second posterior cell, its base just a little nearer the base of the wing than that of the

second posterior cell, its stem equal to about half the length of the cell, and about equal to the stem of the second posterior cell, the latter shorter than its cell; posterior cross-vein about its own length distant from the mid cross-vein; costal vein dark; fringe brown; halteres with ochraceous stems and the knobs densely clothed with grey scales.

*Length*.—5 mm.; with proboscis 7·5 to 8·5 mm.

♂. Head and thorax ornamented as in the ♀; proboscis yellowish in the middle, black at the apex and base; palpi a little longer than the proboscis, yellowish, with black scales, the last two joints with dull white dorsal basal patches of scales, their apices dark scaled, hair tuft on penultimate joint flaxen, on the antepenultimate dark brown; hairs on the last joint brown and flaxen; the last joint smaller than the penultimate: there seems to be another (third) pale broad band, yellowish in colour, nearer the base; antennae banded, with silky brown plumes.

Abdomen narrow, the bases of the segments with narrow bands of white scales, which spread out laterally to form white lateral spots; the basal bands send a median patch across the segments as in the ♀, and there are traces of white apical scales, last two segments mostly white scaled, venter densely golden

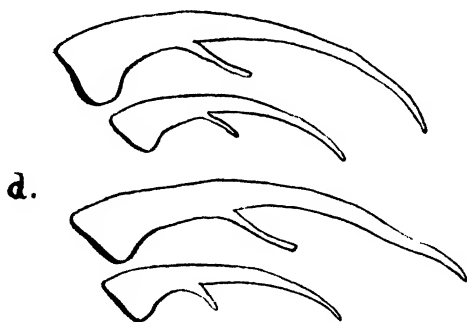


Fig. 156.

*Culex pulcripalpis*, Rondani.

d, Male unguis.

scaled; unguis of the fore legs unequal, both uniserrated, in the mid legs more unequal, both toothed; hind equal and simple.

*Length*.—6 mm.; with proboscis 9·5 mm.

*Habitat*.—Italy (Rondani and Ficalbi); England (Dr. Rees) (76).

*Time of capture*.—July, in England.

*Observations.*— Four specimens of this species were taken by Dr. Rees in the Albert Dock, Tilbury, and sent to the Museum. They answer best to Rondani's *C. pulcrispalpis*, and I think are undoubtedly that species; they also agree to Rondani's *C. penicillaris* and his closely related *C. pulcritarsis*. It cannot be *C. penicillaris*, although it answers so nearly to it, because the last hind tarsi are white; no mention of this marked character is made by Rondani, or Ficalbi in his more recent description from Rondani's specimen and fresh material as well: it cannot be *C. pulcritarsis*, because, according to Ficalbi, the ♂ tarsi have the larger fore unguis biserrated, whereas these specimens have unserrated unguis; no mention is made of the unguis of *C. pulcrispalpis*, and as that species has the end tarsi of the hind legs white, I think the specimens sent by Dr. Rees must belong to that species.

Rondani's description is based on a poor specimen in which the thoracic ornamentation seems to have been denuded. There are differences in the abdomen, but in the two specimens in the collection the abdomen varies, and I think that discrepancy must not be taken into account.

On the other hand, I should certainly have said Dr. Rees' specimens were Rondani's *C. penicillaris* had Ficalbi stated that the last tarsal joints in the hind legs were white, and that the larger anterior claw of the ♂ had one tooth, not two.

This is the first record of this species in England, the only other locality being Italy. It was probably introduced to the Albert Dock on some ships coming from Italian ports, and is probably a recent introduction, being a too well-marked species to have escaped notice. It closely resembles *C. dorsalis*, but the last hind tarsal joint is white.

#### 58. *CULEX DORSALIS*. Meigen.

(Syst. Besch. iv. 242, 18, et i. 2, 3, Meigen; Dipt. Scand. ix. 3464, Zetterstedt; Isis (1831), 1203, 50, Ruthe; Fn. Austr. ii, 627, Schiner; Dipt. Neer. 325, Van der Wulp; Bull. Soc. Ent. Ital. p. 246 (1896), Ficalbi; Ent. Mo. Mag. p. 228 (1895), Austen.)

(Fig. 84, PL. XXI.)

Thorax brown, with bright tawny-red curved scales and pale creamy scales forming two lines on the mesothorax, and also forming a line in front and a patch before the scutellum. Abdomen

brown, with a few scattered pale scales and creamy basal bands, a central line of pale yellow scales and pure-white lateral spots. Ungues equal and uniserrated in the ♀.

♀. Head brown, with pale yellowish curved scales in the middle, upright pale forked ones and ochraceous flat ones at the sides; antennae brown, basal joint bright ferruginous, basal and next few following joints with creamy scales; palpi yellowish-brown, with brown and dull creamy scales, especially at the apex; proboscis brown, darker towards the tip.

Thorax brown, densely clothed with bright reddish-tawny curved scales and pale creamy scales forming a line in front and two others running down the dorsum of the mesothorax; the scales in front of the scutellum are also rather paler; scutellum bright ochraceous brown, with pale curved creamy scales and golden-brown border-bristles, which are especially thick on the lateral lobes; metanotum brown; pleurae brown, with numerous creamy scales.

Abdomen covered with rich brown scales with a few pale ones scattered about, each segment with a basal creamy band rather narrowed towards the sides, and with almost white lateral spots; a central line of pale yellow scales runs down the whole length of the abdomen; the first segment has two patches of white scales and numerous pale hairs, the posterior borders with pale hairs also; venter with many white scattered scales.

Legs with the coxae brown with pale scales; femora yellowish-brown with black and yellow scales, the black thickest near the apex, tibiae also deep yellowish-brown with numerous scattered black scales which seem especially thick above; apex yellowish-white and also the knee spots; both femora and tibiae with numerous black bristles; fore metatarsi and tarsi dark brown; the mid and the hind ones are deep brown, with narrow apical and basal yellow bands, the bands thus involving both sides of the joints, last joint of the mid and hind legs dark brown; fore, mid and hind unguis equal and uniserrated.

Wings with the brown veins with brown and grey scales, the lateral ones on the second, third and fourth long veins very long and thin; both fork-cells rather short, the first sub-marginal only a little longer and narrower than the second posterior, its stem equal to rather more than half the length of the cell, its base rather nearer the apex of the wing than that of the second posterior; stem of the second posterior about equal to two-thirds the length of the cell; posterior cross-vein about the length of

the mid cross-vein, not quite its own length distant from it. Halteres with yellow stem and brown knob, covered with greyish white scales.

*Length*.—5 to 5.5 mm.

♂. Palpi deep brown, with paler bands at the bases of the joints, a hair tuft at the base and another at the apex of the penultimate joint.

*Length*.—5 mm.

*Habitat*.—Scandinavia (Zetterstedt); Holland (Van der Wulp); Berlin (Meigen); Austria (Schiner); England (Walker, Piffard, Bradley, F. V. T., &c.).

*Time of appearance*.—In England in August (Piffard, F. V. T.); in Southern Scandinavia in June and September (Zetterstedt); in Denmark in August (Staeger); in Holland in August (Van der Wulp).

*Observations*.—This gnat in many respects resembles *C. pulcritarsis* of Rondani, but differs from it in not having the last hind tarsal joint white, in the simple ungues and in the venation, but at first sight it bears a strong resemblance, especially in regard to the marked thoracic ornamentation. This mosquito seems widely distributed in Europe, and in some places is locally very abundant. Mr. Piffard \* records it in "vast numbers" at Aldeburgh on the Suffolk coast, where it is known as the "Norway mosquito." It seems to have been abundant there for at least the last twenty-five years. "A tradition," says Mr. Piffard, "accepted here (Aldeburgh) assigns its introduction to a particular yacht which used to ply between this port and Norway." I have found it in numbers in a garden at Rochester, where it caused much annoyance, and Mr. Bradley also sends me a specimen from Wyre Forest. It appears to be not rare at Copenhagen, for Staeger found the adult not uncommon, whilst the larvae were in great abundance in lagoons in the Island of Amagu at Copenhagen. In Norway it is evidently rare, for I can only find one record, namely from Christiania. The bite is very severe and the insect most ravenous in warm weather, biting both night and day. I have noticed that this species prefers settling on a dark surface, people with black clothes for instance, being especially chosen for their attack.

\* Ento. Mo. Mag. p. 227 (1895).

59. *CULEX PENICILLARIS*. Rondani.*C. dorsalis*. Meigen (?).

(Boll. Soc. Ent. Ital. (1872), Rondani; Venti Sp. Zanzare Italiane, p. 112 (1899), Ficalbi.)

I have not seen this species, so add some notes from Ficalbi.

"Proboscis yellowish; brownish-black on the distal third and at the base. Palpi of the ♂ brown at the base, straw-coloured for the remainder of their length, with a dark brown ring near the base and on the antepenultimate joint, which is dark brown; antepenultimate joint with long flaxen-brown hairs, last two joints somewhat dilated and with hairs also; the last two joints are darker with a minute white basal ring to each; in the ♀ the palpi are dark brown; antennae of the ♀ with yellowish basal joint, the rest of the antennae dark brown, with yellow tomentum; in the ♂ the basal joint has yellow scales, the remainder light brown with large plume.

"Thorax has a brassy hue, caused by 'dense opaque tomentum,' with a reddish tint at the sides and a lighter line along either side of the middle line.

"Abdomen of the ♀ dark chocolate brown and yellowish, the latter colour forms a median line and basal bands to each segment; there are also lateral spots which spread out across the segments, the venter is

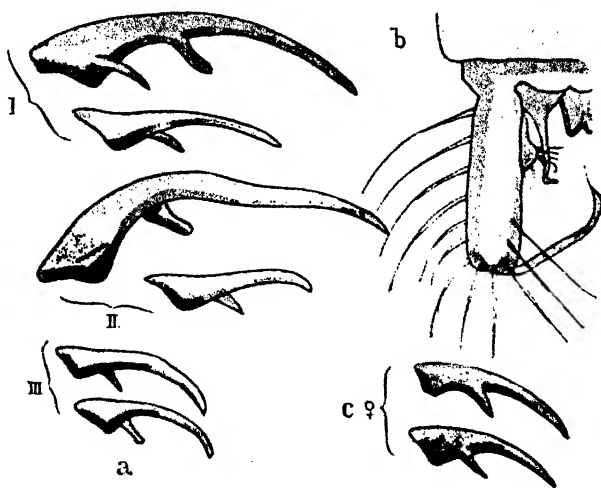


Fig. 157.

*Culex penicillaris*, Rondani (after Ficalbi).

a. I. II. III. = ♂ unguis; b = ♂ genitalia; c = ♀ unguis.

yellowish with a narrow median black line and black lateral spots. In the ♂ the dark markings on the yellowish abdomen are in the form of lateral triangular spots, especially marked on the fifth, sixth, and seventh segments, the eighth having only a median spot; ventrally the

abdomen is pale yellow, with a median dark line and small dark lateral spots on each side. Legs with yellow-scaled coxae, femora yellow with mottlings of dark brown and a dark distal ring, knee spot white; tibiae brown with a dark distal ring, followed by a white one; tarsi brown with a yellowish sheen, apically and basally pale banded; female ungues equal and uniserrated; in the ♂ the first and second pair are unequal, the mid ones particularly so, the larger one in both with two teeth, the smaller and the equal hind pair uniserrated.

"Ficalbi also figures the ♂ genitalia (Fig. 157).

*Length*.—5 to 9 mm.

*Habitat*.—Italy."

*Observations*.—Ficalbi gives a detailed description of this species in his paper "Venti Specie Zanzare (*Culicidae*) Italiane," p. 112. It is closely allied to *C. dorsalis*, Mg., *C. pulcritarsis*, and *C. pulcripalpis* of Rondani, but is clearly distinct.

#### 60. *CULEX GELIDUS*. n. sp.

(Fig. 93, Pl. XXIV.)

Thorax dusky yellowish-brown to brown, with the front two-thirds covered with frosty-white curved scales, the hind portion with almost black scales and long dark bristles. Abdomen brown with basal creamy-white bands and pale lateral spots. Ungues of the ♀ equal and simple.

♀. Head with frosty-white curved scales in front, and upright white ones at the back, sides clothed with ochraceous scales, with apparently two yellow bristles at the edge projecting forwards from the middle; eyes dark purple; palpi with black scales, slightly ochraceous towards the base on the inner side;



Fig. 158.

*Culex gelidus*, n. sp.

Side view of thorax and hind tarsus.

proboscis yellowish, with a broad dark band towards the apex, extreme apex pale, and a few brown scales on the basal half making it look slightly darker; antennae yellowish-brown, with pale bands, pubescence and verticillate hairs brown; basal joint dark, base of second joint pale testaceous, which colour also shows in the hollow of the basal joint.

Thorax yellowish-brown, covered with frosty-white curved scales for about two-thirds of the length of the mesonotum, the hinder part of the mesonotum with scattered deep black curved scales, and four dorsal rows of (as well as

lateral) black bristles; bristles on the frosty area yellowish-brown, dark brown at the sides; scutellum yellowish-brown, with three patches of black scales and long dark bristles; metanotum yellowish-brown, with a purplish sheen; pleurae pale testaceous with a few black hairs.

Abdomen covered with brown scales with a few scattered creamy ones on the dorsum and sides, each segment with a moderately broad basal band of creamy scales; first segment very pale ochraceous, with a dark ochraceous blotch on each side from which spring long golden-brown hairs, a few purplish and creamy scales in the middle; each segment is bordered posteriorly by short golden hairs; there is also a lateral patch of yellowish scales on each segment rather basally situated; ventrally chiefly ochraceous.

Legs deep ochraceous with scattered dark scales, femora with but few dark scales, tibiae with rather more, fore metatarsi pale at the apex, slightly so at the base, first tarsal apically and basally pale, second and third basally pale only, fore tarsi therefore with three pale bands, the first two involving both sides of the joints; there is also a trace of pale basal banding on the last joint; mid legs with metatarsi, first and second tarsi basally and apically banded and also the base of the third; hind legs with the same banding, but not so distinct and with the tarsal joints much darker than in the other legs; ungues equal and simple, those of the hind legs very small; front femora with comparatively long bristles.

Wings with a slight yellowish-brown tinge, the veins clothed with rather long brown scales; first sub-marginal cell slightly narrower and much longer than the second posterior cell, its stem very short, about half the length of the cell; third long vein with darker scales than the rest of the wing; posterior cross-vein short, about three times its own length distant from the mid cross-vein, which is about twice as long as the posterior one. Halteres with pale ochraceous to white stem and with dark knob with black scales.

*Length*.—4.5 mm.

*Time of capture*.—July (Quilon, Captain James).

*Habitat*.—Selangor (A. L. Butler, October 23, 1899); Perak and Quilon.

*Observations*.—Described from a single ♀ specimen received in perfect condition, taken by Mr. Butler amongst plantains. It is a very beautiful and distinct species, of a general ochraceous



tinge, with the head and front of the thorax covered with frosty-white scales, giving it a very marked appearance.

It resembles to some extent *Culex confirmatus*, Arribalzaga, but can at once be told by the simple unguis, and thus could not come in the genus *Ochlerotatus* formed for *C. confirmatus* by Arribalzaga, although closely related; hence, for this reason, amongst others, I have abolished his genus.

A single specimen sent by Mr. Wray from Taipang, Perak, differs from the one described to a slight extent, the abdominal bands being swollen in the middle; but I can detect no structural difference. Another ♀ specimen has been given me by Captain James, I.M.S., taken at Quilon, Travancore, S. India; in this the abdominal banding is also swollen in the middle and yellow in colour, and resembles the Taipang specimen.

These I consider form a distinct variety described below.

Var. *cuneatus*.

♀. Abdomen steely-black, covered with dusky-black scales, each segment with a basal band of yellow scales, which form a wedge-like projection in the middle of each segment; posterior

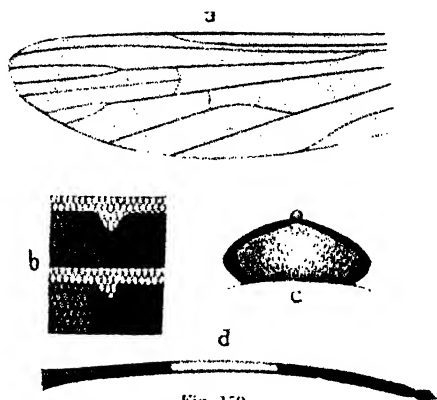


Fig. 150.

*Culex gelidus*, var. *cuneatus*.

a, Wing of ♀; b, abdominal ornamentation;  
c, head; d, proboscis.

borders with pale golden bristles; venter densely covered with yellow scales and a few black ones forming an apical border to the segments.

Wings with both fork-cells short, the first sub-marginal longer and narrower than the second posterior, its stem equal to

nearly half the length of the cell; second posterior cell expanding towards the wing border, its stem about as long as the cell; posterior cross-vein more than its own length distant from the mid cross-vein.

*Length*.—3·5 mm.

*Habitat*.—Taipang, Perak (Wray) (22. 11. and 21. 12. 99); and Quilon, Travancore (James).

*Observations*.—The two specimens from which the above description was drawn resemble the type in so many respects that I cannot look upon them as otherwise than a variety of this species. The difference in the relative length of the cross-veins and fork-cells having proved variable in certain species (i.e. *C. pipiens*, L., &c.), little importance need be paid to that difference seen between the type and the variety in this Asiatic species.

#### 61. *C. TARSALIS*. Coquillett.

(Canadian Ent. xxviii. p. 44.)

*Habitat*.—Argus Mountains (California).

“Thorax black, marked with a dorsal grey vitta, its tomentum yellowish, except a white sub-dorsal undulating line on either side, a spot in front of the scutellum above the root of each wing and on the pleura. Abdomen black, a fascia of white tomentum at the base of each segment, and at the apices of the last three. Both ends of tarsal joints broadly white; fore and mid claws bearing a tooth, hind simple in the ♂, in the ♀ unserrated.” Length, 4·50 mm.

#### BANDED-LEGGED SPECIES, UNIDENTIFIABLE EXCEPT FROM THE TYPES.

*CULEX CASPIUS*. Pallas.

*C. parvus*. Macquart (!).

(Reisen durch das Russisch. Reich. Pallas; Nou. Suit. à Buffon, Hist. Nat. d. Ins. Dip. t. i. (1834), Macquart.)

“Like *C. pipiens*, but a little smaller, with the same buzz and ferocity; greyish; the thorax with cinereous stripes; tarsi indistinctly banded; covered with short pubescence, the wings also with delicate fringes on the veins and margin. Antennae filiform in both sexes; proboscis longer than thorax, its sheath snowy white; palpi very short, scarcely as long as the head, thick.

*Habitat*.—Marshes near the Caspian Sea; treacherous, very common and numerous.”

NOTE.—There are specimens so labelled in the old collection ; they are certainly not this doubtful species however, but *C. nigripes*, Zetterstedt. It is possible that Macquart's *C. parvus* is the same.

CULEX PARVUS. Macquart (1834).

(Nou. Suit. à Buff. Hist. Nat. d. Ins. Dipt. tom. i. (1834).)

"Wings unspotted; tarsi with white rings; for the rest like *Culex pipiens*.

*Length*.—2 lines.

*Habitat*.—France."

NOTE.—This species had best be denounced, as the description is too short to be of any value ; it may be *C. Cuspis*, an equally obscure species ; the leg banding might identify it. They are not unlikely both immature *Culex pipiens*.

CULEX NICAENSIS. Leach.

(Zool. Journ. ii. 292, 2, Leach.)

"Head and thorax dark brown; legs cinereous, with tarsi grey ringed; abdomen dark brown, all the segments bordered behind with cinereous.

*Length*.—10 mm.

*Habitat*.—Nice; common."

NOTE.—Not noticed by Ficalbi or any recent observer, the type apparently not existing. Walker considered it a synonym of *C. calopus*, but the description does not bear any resemblance to that species, which is *S. fasciata*, Fabricius.

CULEX ANNULITARSIS. Macquart.

*S. fasciata*. Fabricius (?).

(Dipt. Exotica, Sup. i. p. 8 (1848).)

"Fuscous; tibiae white ringed; hinder metatarsi whitish, with fuscous rings.

*Length*.—2 lines (♀).

"Legs brown; femora with whitish bases, hind tibiae with a large white ring at the tip; first hind tarsal joints whitish, with a small brown ring.

*Habitat*.—Mauritius."

\*NOTE.—In the small collection sent from Mauritius of common mosquitoes, the nearest to approach this species is *S. fasciata*, Fabricius, which is common on the island. I do not think there is any doubt but that this is only that cosmopolitan insect.—(F. V. T.)

**CULEX BIPUNCTATUS.** Rob. Desvoidy.

(Mem. Soc. d'Hist. Nat. de Paris, t. iii. (1827), Rob. Desvoidy; Suit. à Buff. i. 35, 11, Macquart.)

"Thorax with dorsum dark red and the pleurae lighter, with two silvery spots in front; femora pale yellow; knee yellowish, tarsi ringed brown and yellow; dorsum of abdomen yellow, with a median blackish line.

*Length*.—4 lines.

*Habitat*.—France."

NOTE.—The type is not known, nor has the species been observed since it was described, Macquart evidently mentioning it on Desvoidy's authority. The short description reads, however, as if it were a decidedly distinct species.

**♂♂♂. LAST TWO HIND TARSI WHITE.**

Last two tarsal joints and apex of antepenultimate of

hind legs only white ..... *albitarsis*. n. sp.

Last two tarsi of all legs white, most marked in hind legs.

bases of the metatarsi and first two tarsi also white ... *longipalpis*. Van der Wulp.

Two species only are so far known in this section.

**61A. CULEX ALBITARSIS.** n. sp.

Thorax deep slaty-grey, brown at the sides, covered with deep bronzy-brown scales; head golden scaled; antennae of ♂ brilliant golden-brown; palpi deep brown, with two golden-yellow bands; abdomen rich brown, with basal golden-yellow bands and creamy median and apical lateral spots; legs bright deep brown, the last two hind tarsi and the apex of the antepenultimate shiny white.

♂. Head deep brown, with narrow curved yellow scales over the occiput and numerous rich golden upright forked ones amongst them, sides of the head with flat yellow scales, which

extend along the borders of the eyes to the centre of the frons, the centre of the head appears dark; antennae golden-yellow, with bright golden plumes; basal joint of similar colour; palpi deep rich brown, swollen at the apex, apical joint deep brown, with golden-brown bristles; apex of the long joint with a broad golden band, and also another towards its base; as far as I can see, there are only two palpal joints, but the third may be hidden

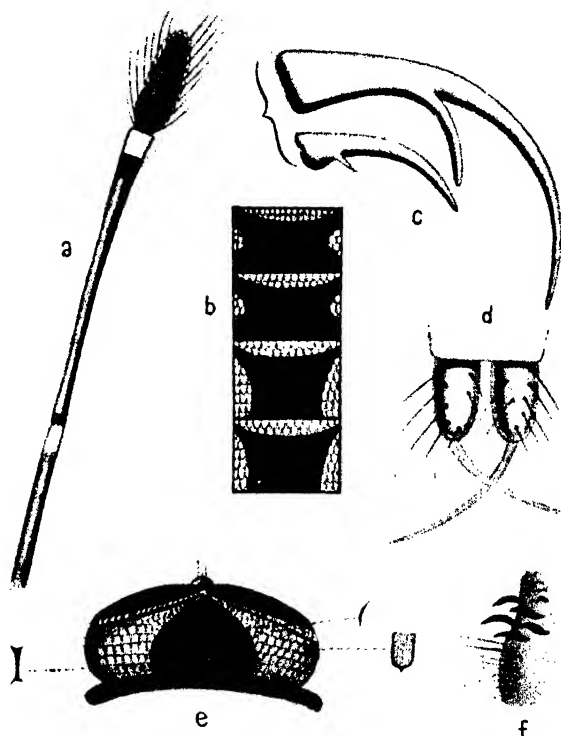


Fig. 160.

*Culox albitarsis*. n. sp.

a, ♂ palpus; b, abdominal ornamentation; c, fore unguis of ♂; d, male genitalia; e, head and scale ornamentation; f, scales at root of wing.

in the brown scales on the apical portion; about as long as the yellowish-brown proboscis.

Thorax brown at the sides, rather slaty-grey in the middle, with numerous small curved bronzy scales, and with some large curved brown scales just in front of the roots of the wings and also some black bristles over the roots of the wings; scutellum

bright deep brown, with golden-brown border-bristles, apparently eight to the mid lobe, and with narrow curved hair-like black scales, which also occur on the mesothorax just in front of the scutellum; metanotum shiny chestnut-brown, rather keeled in the middle; pleurae slaty-grey and rich ochraceous, with a patch of creamy scales.

Abdomen deep ochraceous-brown when denuded, covered with rather narrow brown scales with dull violet reflections, bases of the segments with broad creamy-yellow curved bands, appearing golden in some lights, the second to fifth segments with white lateral median spots, the sixth and the seventh with the white spots almost apical, last segments yellowish with golden bristles; abdomen hairy with brown hairs; male genitalia with the basal joint blackish, with long golden hairs, claspers long, golden-yellow; venter golden scaled, the segments with narrow black apical bands.

Legs deep brown, with an ochraceous tinge, knee spot and tibio-metatarsal joint yellow on each side of the joint; hind legs with the last two tarsi and apex of the antepenultimate one white; the tarsal joints look very pallid in some lights under the microscope; fore and mid ungues rich brown, unequal, both uniserrated; hind ungues equal and simple.

Wings with a yellowish tinge; fork-cells short, the first sub-marginal a little longer and narrower than the widely expanded second posterior cell, its stem about one and a half times the length of the cell, its base a little nearer the base of the wing than that of the second posterior cell; stem of the latter cell about twice the length of the cell; mid and super-numerary cross-veins meet almost in a straight line; posterior cross-vein long, only half its length distant from the mid cross-vein. Halteres with a pale stem and fuscous knob.

*Length*.—6 mm.

*Time of capture*.—July.

*Habitat*.—Bonny, West Africa (Annett).

*Observations*.—Described from a single ♂ in perfect condition taken by Dr. Annett. This is quite the most beautiful *Culex* I have seen; it can readily be told by the brilliant plumes of the antennae and the white hind tarsi. The colours vary in different lights to some extent, the creamy-yellow bands of the abdomen appearing golden in some lights when examined with the naked eye.

In many respects this species resembles Van der Wulp's

*C. longipalpis* (Bijdragen der Midden Sumatra Exped. Dipt. p. 9, D. IV.), described from Alahn Pandjang and Soeroelangoen. The absence of white rings on the fore and mid tarsi in this specimen and the widely separate localities make it doubtful however, so I describe it as a new species. It is strange also that Van der Wulp says the palpi of his ♀'s were *twoeceededig* and *biarticulatus* (although he figures them as 4-jointed), and that I can only detect two palpal joints in this male.

## 62. CULEX LONGIPALPIS. Van der Wulp.

(Bijdragen der Midden Sumatra Exped. iv. p. 9.)

"Fuscous; with the tarsi white-ringed, the two last joints entirely white; palpi longer than the head, distinctly two-jointed. Length, 4·5 mm.

"Antennae brownish-black, indistinctly banded lighter; proboscis yellowish, brownish-black at the root and apex; palpi longer than the head, distinctly two-jointed, each joint growing broader at the end; eyes meeting above the antennae; thorax dark red-brown; abdomen brownish black with perceptibly lighter incisurae; anus ferruginous. Legs with the coxae brownish-yellow; femora and tibiae ornamented with partly dark brown and partly white scales, so as to give a spotted appearance; white rings may be observed at the roots of the first three tarsal joints, and in the middle of the first joint: both the last two tarsal joints whitish, a character which is most marked on the hind tarsi; halteres yellow. Wings somewhat ash-grey, with dark brown scales on the veins, the veins towards the middle remarkably nearer the apex of the wing than the hinder veins; both fork-cells almost equally long.

"In both the specimens from which this description is drawn the scales are somewhat rubbed off. In habitus it somewhat resembles some of our home gnats, but the largely developed palpi are very characteristic."

*Observations.*—A very distinct species with yellowish proboscis, banded black at the base and the apex, and with the last two tarsal joints whitish, especially on the hind legs. The description does not say whether the abdomen is basally or apically pale banded, merely "with perceptibly lighter incisurae."

Van der Wulp gives the habitat Alahn Pandjang and Soeroelangoen.

I have seen no species like this from this part of the world.

## 8885. LEG BANDED ON THE TIBIAE; TARSI UNBANDED.

63. *CULEX UNIVITTATUS*. n. sp.

(Fig. 86, Pl. XXII.)

Thorax deep brown, with scattered golden curved scales; scutellum with three patches of pale, sometimes silvery scales. Abdomen brown to purplish-black, with more or less basal white banding, sometimes rather yellowish, and with basal white lateral spots; venter with broad white basal bands. Legs brown, with small white knee spot and a broad white apical band to the hind tibiae, a smaller one on the fore and mid tibiae. Ungues of the ♀ equal, simple; in the ♂ those of the fore and the mid are unequal, both uniserrated.

♀. Head brown, with creamy-coloured curved scales in the middle and upright brown and black forked scales, a median bare line, sides with flat white scales, a few golden bristles projecting forwards between the eyes, and a pale border round the eyes; some specimens show a dark scaled area of flat scales on each side; antennae brown, basal joint and base of the second joint bright testaceous, basal joint darker inside; palpi black scaled, with a few grey ones; proboscis brown black at the tip; eyes deep brownish-purple.

Thorax deep chestnut-brown, with scattered golden curved scales, which seem brown in some lights, and with brown bristles over the roots of the wings; scutellum deep brown, with short curved pale creamy scales; metathorax chestnut-brown; pleurae umber-brown, with small patches of white scales; the thorax shows two pale longitudinal lines when denuded.

Abdomen covered with deep purplish-black to brown scales, the second segment with a patch of white scales in the middle of its base, the third and fourth with irregular basal bands of white scales, the fifth and sixth with a few white scales at the base, each segment with a basal white lateral spot, triangular in form; venter with broad basal white bands.

Legs with unbanded tarsi; femora ochraceous, with dark brown scales above, and which become black near the apex, knee spot clear yellow, the under surface of the hind femora grey; tibiae dark brown, with a *white apical band*, small in the fore and mid legs, *very conspicuous in the hind*; metatarsi and



tarsi covered with dark brown scales with a bronzy reflection ; ungues of the fore and mid legs equal and simple ; hind ones equal, simple, and small.

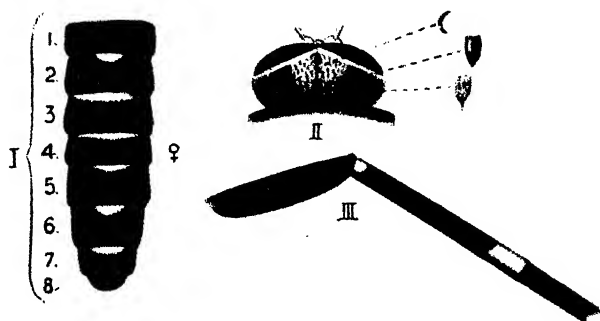


Fig. 161.

*Culex univittatus*. n. sp.

I. Abdominal ornamentation ; II, head and enlarged scales ;  
III, hind femora and tibia.

Wings with the veins covered with brown scales, the lateral ones of the second, third, fourth, and upper branch of the fifth very long and thin ; first sub-marginal cell longer and narrower than the second posterior cell, its stem less than half the length of the cell and not so long as that of the second posterior cell, the stem of the latter not quite so long as the cell ; bases of the two cells nearly level, the base of the first sub-marginal a little nearer the base of the wing than that of the second posterior ; posterior cross-vein nearly twice its own length distant from the mid cross-vein.

Halteres ochraceous, with a dusky line on one side and a slightly darker knob.

*Length*.—4·8 to 5·5 mm.

♂. Head brown, with narrow curved pale scales, white flat ones at the sides, numerous black upright forked ones behind, ochraceous in front ; proboscis dark brown ; antennae grey, with narrow dark brown bands ; plume hairs brown ; palpi longer than the proboscis by the whole of the apical and about half the penultimate joint, brown, with a white band on the basal third ; the last two joints nearly equal, the apical one pointed, both and the apex of the antepenultimate with scanty blackish hairs.

Thorax dark brown, with narrow curved golden-brown scales, with some of a paler hue, often forming two indistinct

pale spots on the mesonotum; abdomen brown, narrow, with basal white bands, the last segment with scattered white scales all over it; male genitalia with the basal joint dark brown, claspers bright testaceous; legs much as in the ♀; fore and mid unguis unequal, both toothed, dark brown; hind equal and simple.

*Length*.—4.5 to 6 mm.



Fig. 162.

*Culex univittatus*, n. sp.  
Fore unguis of the ♂ and ♀.

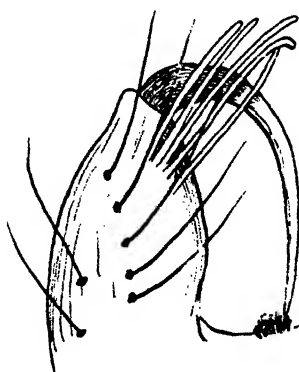


Fig. 163.

*Culex univittatus*, n. sp.

*Habitat*.—Durban (S. R. Christophers) (13. 2. 1899); Salisbury, Mashonaland (Marshall) (79); Singapore (Hanitsch) (4. 9. 1899).

*Time of capture*.—January in Natal; February to April in Mashonaland; July in Singapore.

*Observations*.—This species can easily be identified by the broad white band at the apex of the hind tibiae, similar smaller bands being seen on the fore and mid tibiae. There is some

variation in the different specimens I have examined. Some have the basal abdominal bands almost yellow, and lateral patches pure white, and the scutellar scales almost silvery in three distinct patches, and the white leg band not so wide. In others the basal white abdominal bands are slightly thickened in the middle, and the tibial bands more distinct, and the black scales on the head not so prominent. When the abdomen is swollen with blood or eggs the venter is dull yellow. Although there is evident variation the species can always be told by the single white band on the legs, especially clearly seen on the hind pair. The Singapore specimens came from Bukit Tiniah, and were taken inside a house; those from Natal also were taken indoors. It seems to be a common Mashonaland species, Marshall sending a good series. It bites viciously. There are some closely related species.

#### 64. CULEX QUASIUNIVITTATUS. n. sp.

Thorax dark brown, covered with narrow curved deep red-brown to bronzy scales and two median lines of creamy scales in front, and a small indistinct patch on each side of the mesonotum; scales over the roots of the wings, and in front of the scutellum white. Abdomen black, with basal white bands and large basal white lateral spots. Legs dark brown, apices of the femora and tibiae broadly yellowish-white. Ungues of the ♀ equal, uniserrated in fore and mid legs, simple in the hind legs.

♀. Head dark brown, with some small curved reddish-brown scales in the middle in front; occiput with narrow curved pale creamy scales, sides with a large patch of black flat scales, then flat creamy ones; a few black upright forked scales and some golden bristles projecting in front; antennae dark brown, basal joint dark brown, with white or creamy scales, base of the second joint testaceous; palpi covered with jet-black scales; proboscis dark brown; eyes black, with a silvery lustre.



Fig. 164.

Head of *Culex quasiunivittatus*, n. sp. (♀).

Thorax dark brown, covered with dark bronzy-brown narrow hair-like, curved scales, with two rather indistinct parallel median lines of creamy scales in front of the mesonotum, an indistinct patch on each side, and two lateral patches of broader and almost white ones laterally, one just in front of the wings; there are also a few narrow

curved grey scales in front of the scutellum; in some lights, under the microscope, the thorax appears almost grey in ground colour; scutellum brown, with narrow curved pale scales; metanotum deep brown to almost black; pleurae dark brown, with several large creamy-scaled spots.

Abdomen steely black when denuded, covered with jet-black scales, each segment with a pure-white basal band and lateral white spots; first segment deep ochraceous-brown; venter with broad basal bands of creamy-white scales, the apices of the segments being more or less dark; posterior borders of the segments with short pale bristles.

Legs deep brown to almost black; coxae deep brown, with a patch of creamy scales, base of the femora and their under surfaces pallid; apices of femora pale yellow to white, also the apices of the tibiae; in the hind legs the white apical tibial band is most strongly developed; unguis of the fore and mid legs black, equal, rather thick and uniserrated; hind unguis equal and simple.

Wings with the veins clothed with typical dark brown *Culex* scales, and with a deep brown fringe; the first sub-marginal cell longer and narrower than the second posterior cell, its base just a little nearer the base of the wing than that of the second posterior cell, its stem less than half the length of the cell; stem of the second posterior cell equal to about two-thirds the length of the cell; posterior cross-vein about one and a half times its length distant from and considerably longer than the mid cross-vein; supernumerary and mid cross-veins meeting at a slight angle; halteres with a pale ochraceous stem and fuscous knob.

*Length*.—5 mm.

*Habitat*.—Salisbury, Mashonaland (Marshall) (79).

*Time of capture*.—February.

*Observations*.—Described from a single ♀ in good preservation. It resembles very closely *C. univittatus*, mihi, from the same and other localities in Africa, &c., but can at once be distinguished by the two black patches on the head, by the unguis of the fore and mid legs in the female being serrated, and by the scale structure of the thorax. I have also seen, I think, a female of this species from Natal.

**35555. LEGS WITH FEMORA AND TIBIAE SPOTTED; ABDOMEN  
APICALLY PALE BANDED AND WITH BASAL WHITE SPOTS.****65. CULEX MACULICRURA. n. sp.\***

(Fig. 85, Pl. XXII.)

Thorax dark brown, covered with pale reddish-brown scales, with three round spots of paler scales, a median one in front, two lateral ones behind, from the latter runs backwards a pale line from both spots. Abdomen dark brownish-black, with apical borders of creamy-yellow scales, which are broadest on the last few segments; paler coloured apical borders in the ♂. Legs brown, with the femora and tibiae with a row of yellowish-white spots on one side. Ungues of ♀ equal and simple; the fore and mid of the ♂ unequal, uniserrated; hind equal and simple.

♀. Head brown, with golden-brown curved scales and scattered black upright forked ones, with a tuft of orange bristles in front projecting forwards, and other dark bristles laterally. Eyes black, with a silvery lustre over part of their surface; antennae dark brown, with the basal joint pale testaceous, also the base of the second joint; a few broad yellowish scales on the second joint; palpi very dark brown, with a few pale scales internally; proboscis deep brown to black.

Thorax dark brown, covered with reddish-brown curved scales, with three round spots of pale yellowish scales, the front one median and often rather indistinct, the two hinder ones clear, from each there runs backwards a line of pale scales, more or less distinct; metanotum chestnut-brown; pleurae brown, cinereous below, with a few pale scales.

Abdomen deep brownish-black (sometimes looking quite black under a lens), with an apical border of creamy scales, which are much the broadest on the last two segments; posterior borders fringed with golden hairs; first abdominal segment deep ochraceous, with two patches of dull purplish and yellow scales and with numerous pale hairs.

Legs brown, with the coxae very pallid; femora paler below, deep brown above, with a row of yellowish-white spots on one side, knee spot yellowish-white; tibiae deep blackish-brown with a row of creamy-white spots on one side with an ochraceous

\* Previously described as *C. tigris*, (Grandpre (1900).

tinge in certain lights; metatarsi and tarsi almost black; unguis equal.

Wings with the veins clothed with dark scales, costal border and first longitudinal very dark; posterior cross-vein about half its length distant from the mid cross-vein; first sub-marginal cell considerably longer and slightly narrower than the second posterior cell; base of the wings testaceous. Halteres with a pale stem and black knob.

*Length*.—6.5 to 7 mm.; of proboscis 3 mm.

♂. Antennae dark brown, faintly pale banded with dark brown plumes; palpi longer than the proboscis, dark brown, banded with dull yellow, the apical joint pointed, yellowish at the tip, with a narrow pale band at the base with grey scales; penultimate joint much shorter, pale at the apex and base, with grey scales on the latter; the long antepenultimate joint paler, with brown scales, some white ones on the apical half, and a clear pale yellow band lower down, base of the palpi darker brown: the last two joints, especially the penultimate, with long coarse black hairs.

Thorax dark brown, with curved pale scales, the two paler spots being seen, but the median front one invisible; scutellum with pale creamy scales.

Abdomen narrower than in the ♀, with apical yellowish-grey bands of scales and traces of white basal lateral spots, the last two segments with many grey and yellowish scales; genitalia dark brown, densely ornamented with deep reddish-brown hairs; fore and mid unguis unequal, both uniserrated, deep black, hind ones equal and simple.

*Length*.—6.5 mm.

*Habitat*.—Durban, Natal (S. R. Christophers) (2. 13. 1899); British Central Africa (Dr. Daniels) (82); Mombasa (McKay) (76); Bonny (Annett); Salisbury, Mashonaland (Marshall) (79); Queensland (Bancroft).

*Time of capture*.—January in Durban; May at Mombasa (McKay); February and March in Mashonaland (Marshall).

*Observations*.—Described from three ♀'s and one ♂ from Natal. It is a large mosquito, readily identified by the row of spots on the femora and tibiae and by the apically banded abdomen. Those from Natal and British Central Africa are very similar, but the ♀ sent by Mr. McKay from Mombasa presents some minor differences, not of specific value however. This latter ♀ shows the basal white lateral spots on the abdomen very

clearly, such as I notice in the British Central African specimens; the thorax also shows two median parallel pale lines and two lateral ones on the posterior half of the mesonotum, and I noticed in this specimen three very distinct lines of dark bristles, the lateral ones ending in a clump of bristles at the scutellum. This I take to be only a local variety, var. A, *Mombasaensis* (Fig. 165).

It is a very annoying species. Two ♀'s sent by Mr. Marshall from Mashonaland were at first taken to be a distinct species, but as there are no structural differences, I include them here as varieties of *C. maculicrura*. The two spots on the first abdominal segment are deep black only, there being no creamy scales, and

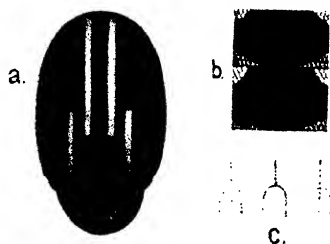


Fig. 165.

*Culicoides maculicrura*, var. *Mombasaensis*. n. sp.

a. Thorax; b, two abdominal segments; c, mesothoracic arrangement of chaetae.

they present rather a dusky brown appearance, and seem more stoutly built, and the white basal lateral patches are very distinct. They are also somewhat smaller in size, but the venation, the spotted legs, the apical banding and spotting of the abdomen and the scale structure, agree so closely with the type that they cannot be separated even as a distinct variety.

Dr. Bancroft has sent me a series from Queensland, which exactly agree with the types from Africa.

A specimen received from Freetown, Sierra Leone, presents a marked difference in regard to the abdominal ornamentation, and I have therefore separated it from *C. maculicrura* as another variety.

#### Var. B, *Sierraleonis*.

Thorax dark brown, with two parallel pale lines running from the front to the scutellum and a pale line on each side from the middle to the scutellum, with scattered pale scales laterally; very much like var. A, *Mombasaensis*.

Abdomen dark brown, with a few scattered yellow scales at the bases of the segments, especially at the sides. Posterior cross-vein very nearly level with the middle cross-vein.

*Length*.—7 to 7.5 mm.

*Habitat*.—Sierre Leone (Berkeley, August, 1899; 26. 7. 1899).

*Time of capture*.—August.

*Observations*.—Very similar to the type, but has traces of basal yellow scales instead of apical ones. A single ♀ only received.

#### LEGS NEITHER BANDED NOR SPOTTED (1ST DIVISION).

A variety of forms are here included, with basally spotted (A), basally banded (A<sup>3</sup>), unbanded (A<sup>5</sup>), apically banded (A<sup>7</sup>), and mottled abdomens (A<sup>4</sup>), &c.

#### LEGS UNBANDED.

A. Abdomen with lateral white spots, and with white basal patches.

α. Abdomen with median line of pale scales.

β. Thorax adorned.

Thorax black, narrow median line of yellow scales, a broad one on each side; abdomen with median line of white scales spreading out apically and laterally ..... *albifasciatus*. Macquart.

Thorax with front half silky yellowish-grey, remainder dark brown; abdomen with median line of ochre scales ..... *confirmatus*. Arrillaza.

aa. No median pale abdominal line.

γ. Thorax adorned.

Thorax with broad grey median line; abdomen with pallid testaceous basal banding *serratus*. n. sp.

Thorax bright ferruginous, pleurae slate color; lateral abdominal patches of creamy scales sometimes apparently absent *fuscus*. Zetterstedt.

Thorax dark brown with narrow golden curved scales; abdomen with white lateral spots ..... *iracundus*. Walker.

Thorax golden scaled, with lateral lines of brighter golden scales on posterior half of mesonotum; abdomen with lateral curved silvery-white spots ..... *pulcriventer*. Giles.

Thorax bronzy-brown, with a narrow median line of creamy white, and broader lateral pale lines contracted in the middle ..... *lateralis*. Moigen.



γγ. Thorax unadorned.

Thorax chestnut-brown, with tawny and black curved scales; abdomen with basal white lateral patches which extend transversely and form more or less basal bands *nuncus*. n. sp.

Thorax brownish-black, sides and spots on pleurae white; abdomen black, with white ventral bands and lateral spots ... *subulbatus*. Coquillett.

Thorax deep brown, with narrow deep brown curved scales; abdomen deep or blackish-brown with basal white lateral spots (very small, 2·5 mm.) ..... *atratus*. n. sp.\*

Thorax grey; abdomen with basal white spots forming more or less a lateral line *cineurus*. n. sp.

Thorax with fawn-coloured scales and black bristles ..... *nigrochaetae*. n. sp.

A<sup>1</sup>. Abdomen unbanded and unspotted.

Thorax grey, with three dusky lines, no lateral white spots. .... *pseudocinereus*. n. sp.

Thorax with silvery scales on front half, bright brown behind; abdomen metallic purple ..... *metallicus*. n. sp.\*

Thorax chestnut-brown, golden scaled, with two median bare lines and a bare patch on each side of the mesonotum ..... *Frenchii*. n. sp.

Thorax dark chestnut-brown with black scales; pleurae pale brown to grey, with long black bristles; legs long; fork-cells short ..... *longipes*. n. sp.\*

A<sup>2</sup>. Abdomen with apical patches.

Thorax dark brownish-grey, with long grey scales ..... *Fredericounensis*. n. sp.

A<sup>3</sup>. Abdomen with basal pale bands.

δ. Thorax adorned.

Thorax with sides of mesonotum orange scaled ..... *luteolateralis*. n. sp.

Thorax with two dark median lines, and two lateral posterior ones on golden-brown surface; abdomen with bands, expanded at the sides and in the middle ..... *diversus*. n. sp.

Thorax deep brown, creamy white at sides, with backwardly projecting pale lines, and two median pale lines on chestnut-brown median area; abdominal bands white ... *punctator*. Kirby.

Thorax black, golden scaled, chestnut-brown in middle; abdominal bands yellowish or white with lateral spots ..... *nemorosus*. Meigen.

\* These will have to be removed with some other new species to separate genera.

55. Thorax unadorned.  
 Thorax chestnut-brown with golden scales;  
 white abdominal bands and lateral spots ..... *consobrinus*. Des-  
 voidy.  
 Thorax brown, golden scaled; abdominal  
 bands ochraceous ..... *sagax*. Skuse.  
 Thorax dark brown, with dull golden scales  
 more or less longitudinally arranged;  
 venter white scaled with median black  
 spots ..... *pervigilans*. Bergroth.  
 Thorax fuscous, testaceous at the sides ..... *australis*. Erichson.  
 Thorax black, with dull ferruginous scales;  
 bands of abdomen pure white ..... *nigripes*. Zetter-  
 stedt.  
 Thorax black, with ferruginous scales, paler  
 at the sides; abdominal bands white,  
 spreading out laterally, post. cross-vein  
 further distant than in former species ... var. *silvae*.  
 Similar to *nigripes*, but the stem of the  
 1st sub-marginal cell is shorter, not longer,  
 than the cell ..... var. *impiger*.  
 Walker.  
 Thorax brown, with scattered creamy scales;  
 bands of abdomen white, last two seg-  
 ments with basal white lateral patches ... *hirsuteron*. n. sp.
- A<sup>4</sup>. Abdomen with black and creamy-white scales and  
 black lateral patches.  
 Thorax black, with narrow golden-brown  
 scales, creamy at the sides, and has two  
 short lines behind ..... *Spencerii*. n. sp.
- A<sup>5</sup>. Abdomen with apical and basal banding; thorax  
 dark grey, with two longitudinal brassy stripes  
 behind ..... *impudicus*. Ficalbi.
- A<sup>6</sup>. Abdomen with ochraceous scales, with long tri-  
 angular black-scaled lateral patches; thorax  
 black, with golden scales and two golden-scaled  
 lines ..... *ochraceus*. n. sp.  
 Lateral dark patches, not triangular;  
 thorax with three pale scaled lines ..... *trilineatus*. n. sp.
- A<sup>7</sup>. Abdomen apically banded.  
 First few segments with apical yellow  
 bands, remainder all ochraceous yellow... *concolor*. Desvoidy.  
 Abdomen brown, with faint traces of pale  
 apical bands ..... *terrificus*. Walker.  
 Thorax brown scaled, with median dark  
 line and lateral dark lines; all the ab-  
 dominal segments apically yellow banded *Salisburyensis*. n. sp.  
 Thorax grey, with four dark lines; abdomen  
 ashy-grey, with two rows of black spots *rusticus*. Rossi.

A<sup>8</sup>. Abdomen dusky, with apical pale borders, basal lateral patches of ochraceous scales and a median ochraceous line.

Thorax rich golden-brown, with two pale parallel longitudinal lines ..... *mediolineatus*. n. sp.

A<sup>6</sup>. Abdomen with basal white triangular spots on segments.

Thorax brown in front, pallid behind, with three double rows of black bristles in front, two on posterior part of mesonotum. *inflictus*. n. sp.

# 66. CULEX ALBIFASCIATUS. Macquart (1838).

*Culex vittatus*. Phillipp (1865).

*Ochlerotatus albifasciatus*. Arribalzaga (1896).

(Dipt. Exot. i. 35, 4 (1838), Macquart; Dipt. Argentina, p. 44, Arribalzaga; Verh. zool.-bot. Gesell. xv. 596, 6 (1865), Phillipp.)

Thorax black, ornamented with narrow, reddish-brown curved scales, with a median yellow-scaled line and a broad line of yellow scales on each side in front, narrowing behind. Abdomen dusky brown, with a median yellowish-white line spreading out apically on each segment, and with a basal patch of pure-white scales on each side of the segments. Legs with brown and grey scales. Ungues of the ♀ equal, uniserrated.

♀. Head covered with creamy-yellow curved scales and upright forked pale yellow ones in the middle, a band of dusky-yellow curved ones and numerous black upright forked ones on each side, then small, dark, flat scales and flat, pale, dull yellowish ones at the sides, a border of short golden-brown bristles projecting forwards over the eyes (at the sides), and some pale ones between the eyes; antennae deep brown, except the deep bright brown basal joint and the yellowish-brown second joint; basal joint with pale scales; palpi covered with deep brown scales; proboscis deep brown.

Thorax black, ornamented with narrow, bright reddish-brown curved scales, with a narrow, often indistinct, median line of yellow scales, and a broad line of yellow scales on each side in front, which narrows to a thin line behind with three rows of brown bristles and numerous golden-brown ones over the roots of the wings; scutellum pale reddish-brown, with pale curved scales and brown bristles to the posterior border; metathorax dull purplish-brown; pleurae dark brown, with numerous patches of frosty-white scales.

Abdomen covered with deep dusky-brown scales, which show rather dull purplish reflections under the microscope, each segment with a median line of yellowish-white scales, which spread out somewhat apically, and with a basal patch of pure-white scales on each side, which extend along the sides of the segments so as to form a more or less jagged lateral white line on the last two segments; the yellowish median scales spread out so as to form a small apical band; first segment ochraceous brown, with a median patch of white scales and numerous long pale hairs, which also border the segments and are also numerous laterally; venter with numerous white scales, very dense apically.

Legs yellowish-brown, covered with brown and grey scales; coxae reddish-brown, with white scales; femora with pale yellowish-grey scales beneath, blackish-brown above, with a few scattered grey ones; knee spot white, small; tibiae the same as the femora; tarsi darker, almost black; ungues of all feet equal, uniserrated.

Wings with the veins brown with brown scales, the lateral ones long and narrow; both fork-cells rather short, the first sub-marginal narrower and slightly longer than the second posterior cell, the stem equal to half its length and about equal to the length of the stem of the posterior cell, their bases about level; posterior cross-vein the same length as the mid cross-vein and about its own length distant from it.

Halteres with bright ochraceous stems and dusky knobs covered with greyish-white scales.

*Length*.—5 to 6 mm.

♂. Abdomen with the median line formed of more distinct obtriangular spots and with more dense woolly hairs on the sides; palpi dark brown with dense fuscous tufts.

*Length*.—5 mm.

*Habitat*.—Buenos Ayres in Baradero, Chacabuco, Chascomús, Chivilcoy, Navarro, Las Heras, Las Conchas, and in the Island of Antequera (Arribalzaga); Buenos Ayres and Brazil (Macquart); Buenos Ayres (Bigot); Misiones (E. L. Holmberg); Chili (Phillipp); Rio de Janeiro and Sao Paulo (Lutz).

*Observations*.—Described from two ♀'s from Bigot's collection. The type is in the Jardin des Plantes, but the characteristic thoracic ornamentation cannot be seen owing to its being denuded. This species comes in Arribalzaga's genus *Ochlerotatus*, but differs so much from *O. confirmatus* that I place it back in the old genus *Culex* with *C. confirmatus*, Arribalzaga. It is a

very common and annoying species in the Argentine ; it is also a common wood mosquito in Sao Paulo, Brazil, so Dr. Lutz informs me ; "it also," he says, "occurs on shady river sides." It does not enter into houses, and stings in the daytime.

Two specimens have been received from South America in the collections sent by Dr. Lutz and Senhor Moreira.

67. *CULEX CONFIRMATUS*. Arribalzaga.

(Dipt. Argentina, p. 46.)

(Fig. 94, Pl. XXIV.)

Thorax clothed in front with silky pale, yellowish-grey scales, which become paler halfway across the mesonotum, the back portion darker with brown scales, the latter densely bristly. Abdomen dark brown with violet reflections, each segment with basal white lateral patches, and sometimes the abdomen has a median yellow line, which is thickest at the bases of the segments and spreads out over the whole of the last segment. Legs deep brown, with ochraceous and bronzy reflections ; fore and mid ungues of the ♀ equal, uniserrated ; in the ♂ the fore and mid are unequal, the smaller uniserrated, hind ones equal, uniserrated.

♀. Head dark brown, clothed with pale creamy curved scales in the middle and with ochraceous ones at the sides and behind, and with upright ochraceous forked ones ; sides with flat scales ; eyes deep purplish-black and silver, with flat ochraceous scales round them ; clypeus deep purplish-brown ; antennae dark brown, basal joint and the greater part of the second joint testaceous ; palpi short, black scaled ; proboscis covered with shiny black scales.

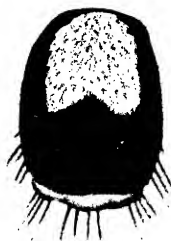


Fig. 166.  
Thorax of *Culex confirmatus*  
Arribalzaga.

Thorax clothed in front with pale, silky, yellowish, narrow curved scales, which gradually become pure silky white about halfway across the mesonotum, the remaining part of the mesonotum darker, covered with scattered brown scales, as also are the sides, the posterior half of the mesonotum has four rows of golden-brown bristles ; scutellum deep brown when viewed in one

direction, ochraceous brown in the other, with creamy scales and a border of golden-brown bristles ; in some specimens pale

in the middle, dark at the sides; metanotum chestnut-brown with a dull purplish tinge; pleurae chestnut-brown, with patches of white scales.

Abdomen with the segments covered with deep blackish-brown scales, ground colour testaceous, this colour showing through the bases of the segments to a slight extent; down the middle of the abdomen runs a line of ochraceous scales, which are thickest at the bases of the segments, and which become lighter and spread out over the whole of the last segment; in some specimens these ochraceous scales are absent; each segment has a basal lateral patch of pure white; the hairs on the posterior borders pale brown; venter covered with creamy-yellow scales; in some specimens the apical borders of the venter have a triangular black patch on each side.

Legs covered with deep brown scales with a bronzy ochraceous reflection in some lights; femora whitish beneath nearly to the apex, which is dark, coxae testaceous; hind metatarsi not quite so long as the hind tibiae; fore and mid ungues equal, toothed.

Wings with the first sub-marginal cell longer and narrower than the second posterior cell, its stem equal to about two-thirds the length of the cell; stem of the second posterior cell nearly equal to the length of the cell; posterior cross-vein about its own length distant from the mid cross-vein; costa, first long vein and third long veins blackish; halteres pale with slightly fuscous knob.

*Length.* 4.5 to 6 mm.

♂. Antennae pale brownish ochraceous, with dark brown bands and brown plume-hairs; proboscis nearly as long as the palpi, dark brown; palpi covered with steel-black scales, last joint dark, like the rest of the palpus, hairs dark brown.

Abdominal segments ochraceous at their bases, dark dusky-black on the apical half, which is covered with deep, dull, purplish-black scales, bases of the segments pale, partly owing to the ochraceous ground colour and partly to pale ochraceous scales, there are also a few basal white scales; from the fourth to the seventh segments are more or less triangular patches of white scales placed laterally and at the base of the segments; the last segment is covered with pale fuscous scales; claspers steel black; posterior border of the segments and the sides with long golden hairs.

Ungues unequal on the fore and mid legs, equal on the hind legs, similar to *C. serratus*.

The male differs from *C. serratus* in that the claspers are steel black instead of yellowish-brown, as well as in the thoracic ornamentation, &c.

*Habitat*.—Jamaica (F. Cundall and Dr. Grabham) (7. 12. 1899) ; Rio de Janeiro (Moreira) (9. 12. 1899) ; New Amsterdam (Rowland) (61) ; Buenos Ayres (Arribalzaga) ; Brazil (Dr. Lutz).

*Time of capture*.—July, and again in November in Brazil ; February in British Guiana.

*Observations*.—The Jamaican specimens differ from the others only in a few points, namely, the thorax is more silky white in front ; the posterior cross-vein is distant about its own length from the mid cross-vein, and the abdomen has a median line of ochraceous scales along its whole length in a few cases, expanding out so as to cover the whole of the last segment, and the venter is entirely creamy scaled. Dr. Lutz says the species occurs on the borders of overflowing streams and swamps, and stings in the daytime.

Dr. Grabham bred the species from larvae collected in stagnant algae-containing permanent pools at Ferry and Rockfort, Castries ; he says, " Both males and females live on banana slices. The female alone sucks blood. The larval stage lasted in aquarium exposed to sun about eight days, the pupal stage thirty-six to forty-eight days. Imago emerges generally between five and seven p.m. This species appears to be active only during the night " (Grabham). Dr. Rowland's specimens were taken on drained land and in houses. I think this insect is Arribalzaga's species, *O. confirmatus*, but there is no basal silky white banding in any of the specimens, and the first sub-marginal cell is longer and narrower than the second posterior cell. It answers in so many respects, and seems such a widely-spread insect in S. America and the West Indies, that I do not consider these differences as more than local variations. The specimens received show it to be subject to some variation both in colour and in the position of the posterior cross-vein. The Brazilian specimens agree with the West Indian.

The specimens examined have the fork-cells of slightly unequal length, not of equal length, but the other characters given by Arribalzaga as of generic importance for the genus *Ochlerotatus* hold good, namely, the small apical joint of the palpi and the ♂ and ♀ ungues. But as the closely related *C. gelidus*, mihi, does not answer to these points, and as several other very diverse species do, I am forced to neglect Arribalzaga's genus.

68. *CULEX SERRATUS*. n. sp.

(Fig. 95, Pl. XXIV.)

Thorax dark brown, with a broad stripe of creamy-grey in the middle. Abdomen brownish-black, with basal white lateral spots, especially noticeable on the apical segments. Ungues of ♀ equal, unserrated; of ♂ unequal in fore and mid legs, the larger one with two teeth, the smaller with one tooth.

♀. Head brown, clothed with white scales in front and in the middle, brown above and white at the sides, with a few upright yellow forked-scales; eyes purple, bordered with a narrow edge of white; antennae brown, first joint and base of the second testaceous, with a few fuscous scales, the remaining joints clothed with a pale pubescence and with black verticillate hairs; palpi black, with a few dark grey scales; proboscis black.

Thorax dark brown, with a broad stripe of creamy-grey scales in the middle, extending from and continuous with the white in the middle of the head and passing back to the scutellum; sides of the mesonotum clothed with dark curved scales, and with golden hairs at the sides and back; scutellum brown, with white scales in the middle and black laterally; metanotum chestnut-brown; pleurae testaceous, with patches of white scales.

Abdomen covered with dark brownish-black scales, with purplish reflections, the deep yellow ground colour showing through at the base in some specimens, giving an almost basally-banded appearance, which in other specimens is absent; laterally there is a basal silvery-white spot, which partly shows on the dorsum, in some specimens most clearly on the last few apical segments; first segment ochraceous, with a patch of purple scales in the middle, and very pilose; posterior borders of the segments edged with long pale hairs; venter almost entirely clothed with white scales.

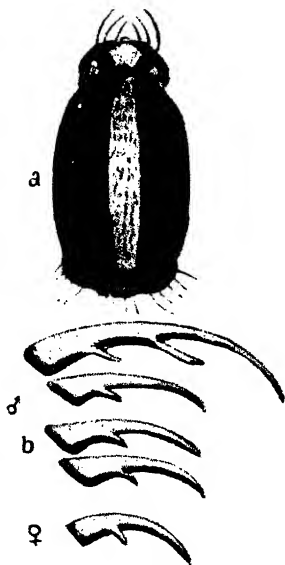


Fig. 167.

*Culex serratus*. n. sp.

a, Head and thorax; b, unguis (fore and hind of ♂; fore of ♀).



Legs dark brown; coxae, under surfaces of the femora<sup>4</sup> and the tibiae white; in some lights the legs show metallic blue and deep purple reflections; unguis equal and uniserrated.

Wings with a dusky-yellowish tinge, testaceous at the base; veins clothed with dark brown scales, and edged with long scales towards the apex of the wing, without long scales towards the



Fig. 168.

Wing of ♀ *Culex serratus*, n. sp. (Rio de Janeiro.) (X. 9.)

base; costal and first longitudinal veins covered with deep purplish-black scales; posterior cross-vein scarcely its own length distant from the mid cross-vein; fork-cells both rather short; the first sub-marginal cell very little longer and narrower than the second posterior cell. Halteres pale ochraceous.

Length.—5.5 to 6.5 mm.

♂. Antennae pale ochraceous, with narrow brownish bands at the verticils; plume-hairs brown; proboscis black; palpi covered with dark brown scales, the last joint pale brown, hairs brown; a little longer than proboscis.

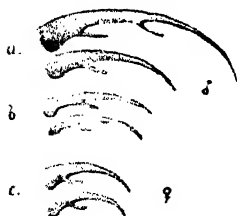


Fig. 169.

*Culex serratus*, n. sp.

a. Fore unguis, and b, mid unguis, of the ♂; c. fore unguis of the ♀. (Abnormal variety.)

Thorax, &c., as in ♀. Abdomen narrow, covered with dark purplish-brown scales, except at the base of the segments and laterally, where they are more or less nude and testaceous in colour; there are also a few white scales on each side of the fifth, sixth, and seventh segments, and several over the apical segments; posterior borders with golden hairs, ventrally pale; ♂ claspers brown; fore and mid unguis unequal, larger one with two, smaller with one tooth; hind unguis equal, each with small thick tooth and basal swelling.

Length.—6.5 mm.

Habitat.—Rio de Janeiro (Senhor Carlos Moreira) (9. 12. 1899); Lower Amazon (Austen) (25. 11. 96); New Amsterdam (Rowland) (61); Trinidad (Urich).

Time of capture.—November, in Brazil (November 5), February, in British Guiana.

*Observations.*—A very distinct species, dull coloured in certain lights, with a broad band of light scales in the middle of the thorax and clear silvery-white spots at the sides, and similarly coloured beneath. Found at New Amsterdam on freshly-drained land and in houses (Rowland).

One ♀ from Rio de Janeiro differs from the rest in having the posterior cross-vein distant about its own length from the mid cross-vein. What remained of the legs also seemed paler, especially the femora, which had many white scales, except at the apex. The thorax had whitish scales in front, the back part being denuded, and the abdomen had a broad pale central mass of scales. It was taken by Senhor Moreira in November with the rest, and is probably only a colour variety.

#### 69. *CULEX FUSCULUS*. Zetterstedt.

(Dipt. Scandinaviae, t. ix. (1850).)

Palpi of ♂ rather longer than the proboscis and with the two last joints somewhat dilated; the antennae with brownish plumes; dorsum of the thorax clothed with ferruginous tomentum; the pleurae dark slate colour. Wings cinereous; legs with the femora and tibiae yellowish, rather browner at the apices; knees marked by a white spot; tarsi yellowish-brown, especially on the last joints; abdomen dorsally black. Length of ♂  $2\frac{1}{2}$ , of ♀ 2 lines. (Zetterstedt.)

Some specimens have dull white spots on the sides of the abdomen.

*Habitat.*—Scandinavia (Zetterstedt); Norway (Siebke).

#### 70. *CULEX IRACUNDUS*. Walker.

(Brit. Mus. List, p. 6 (1848).)

Thorax dark brown, with pale golden narrow curved scales. Abdomen purplish-black, with white lateral spots. Legs unbanded.

♀. Head absent.

Thorax much denuded, brown, with short narrow curved scales; scutellum pale brown, with six brown bristles to the mid lobe, and others on the lateral lobes; metanotum dark brown; pleurae brown, with white scales.

Abdomen covered with deep dusky-black scales, dull purplish in some lights, with white lateral basal spots, and with pale golden-brown border-bristles.

Legs clothed with bronzy-brown scales; coxae brown, with a few pale scales; the ventral surface of the femora pale; unguis narrow, equal, and simple.

Wings with brown scales, the lateral ones being of a very elongated oval form; first sub-marginal cell longer and narrower than the second posterior cell, its stem equal to about half the length of the cell; posterior cross-vein nearly three times its own length distant from the mid cross-vein.

Halteres pale, with a dusky knob.

Length.—5.5 mm.

Habitat.—New Zealand.

Observations.—Redescribed from Walker's type in the British Museum. It is certainly a distinct species. I cannot see how Major Giles makes it synonymous with Erichson's *C. australis* (Walker's *C. crucians*). Hudson in his Manual of New Zealand Entomology figures a mosquito under this name; it is not this species, however, as there is abdominal banding, and it is probably *C. perripilans* or *C. australis*. I think this species should be removed to *Tarniorhynchus*.

#### 71. CULEX PULCRIVENTER. Giles.

(The Entomologist, July, p. 194, 1901.)

(Fig. 92. Pl. XXIII.)

Thorax black, with a patch of golden scales in front, a line of golden scales on each side along the posterior half of the mesonotum, curved downwards in front, a few golden scales at the sides, and a row on each side of the bare space in front of the scutellum. Abdomen black, with basal lateral curved silvery-white patches; venter golden-yellow, with basal white patches and a narrow black border to the segments; traces of a lateral yellow line also seen along the abdomen. Legs black, except at their bases: tibiae with pale bristles. Ungues of the fore and mid legs equal, uniserrated, of the hind equal and simple; unguis of the ♂ unequal in the fore and mid legs, the larger with two and the smaller with one tooth, hind ones equal and simple.

♀. Head black, with a median patch of golden-yellow scales, with a bare line in the middle, black on each side, with a narrow pale line around the eyes and flat white scales at the sides of the head, a tuft of golden bristles projecting forwards between the eyes, with a few narrow, scattered, upright, deep ochraceous ones

over the occiput ; antennae brown, with the basal joint and base of the second joint bright testaceous, the basal joint with numerous dull white scales on its inner side, and the second joint with numerous black scales, giving it an enlarged and black appearance under the hand-lens ; palpi covered with black scales and a few scattered white ones ; proboscis black.

Thorax black, with a dense patch of golden scales in front, with a narrow median dark line, a line of golden scales on each side along the posterior half of the mesonotum, curved down to the sides anteriorly, a few golden scales at the side, and a row on each side of the bare space in front of the scutellum ; there are also three rows of golden and black bristles, the golden ones behind, and numerous golden ones over the roots of the wings ; scutellum black, with two patches of yellow curved scales on the median lobe and a patch on each lateral lobe, each lobe with a tuft of long golden bristles ; metanotum deep brown ; pleurae dark brown, with a few irregular patches of white scales.

Abdomen black, each segment with lateral basal curved patches of brilliant white scales ; posterior borders of the segments with long golden hairs ; venter golden-yellow, with white basal patches, with a narrow edge of black ; these yellow ventral scales also form a line above the lateral borders of the dorsum ; apical segment black, with grey scales only.

Legs black, coxae brown, with patches of white scales ; femora black, white at the base and beneath, also white underneath at the apex, with a small white knee spot ; remainder of legs black, tibiae with pale bristles ; hind metatarsi about two-thirds the length of the tibiae ; fore and mid unguis equal, each with a single sharp tooth ; hind ones equal, but simple.

Wings with a fuscous - brown tinge, and with the veins clothed with brown scales, the lateral ones very long and the median shorter, but longer than in most gnats ; first sub-marginal cell longer and a very little narrower than the second posterior cell, its base, if anything, a little nearer the apex of the wing than

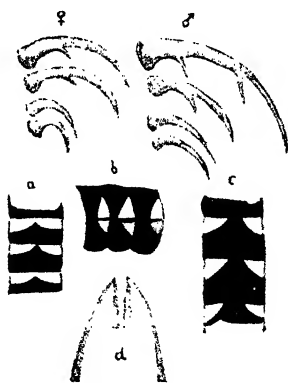


Fig. 170.

*Culex pulexventer*, Giles.

a, Abdominal segments of female ;  
b, side view of the same ; c, abdominal segments of the male ;  
d, wing scales and ♂ and ♀ unguis.

that of the second posterior, its stem a little less than half the length of the cell, about equal in length to that of the second posterior cell, the latter cell nearly twice the length of its stem ; posterior cross-vein about three times its own length distant from the mid cross-vein.

Halteres with a pale stem, fuscous along one side, and with a fuscous knob with some dusky-grey scales over it.

*Length*.—5.5 to 6.5 mm.

♂. Head black, with white curved scales in the middle (in front), with a central bare line, with black and ochraceous upright forked scales on the occiput and nape, the sides clothed with white, a few ochraceous, then black, and then a few more white *flat* scales ; antennae banded brown and white, the last two joints long and darker, plumes chestnut-brown ; palpi black, the last three joints with narrow, basal, dull white rings, hair-tufts brown, a few long golden bristles at the apex of the last two joints ; proboscis black. Thorax as in the ♀. Abdomen nar-



Fig. 171.

Wing of ♀ *Culex puliciventer*, Giles. (X. 9.)



Fig. 172.

Wing of *Culex puliciventer*,  
Giles (♂). (X. 9.)

rower, densely covered with long golden hairs, the basal silvery-white marks on the segments are more distinct, and may unite in the middle to form an almost complete band. Ungues of the fore and mid legs unequal, the larger one with two and the smaller with one tooth ; hind claws equal and simple.

Wings with the first sub-marginal cell longer and narrower than the second posterior cell, its stem equal to a little more than two-thirds the length of the cell, its base about level with that of the second posterior cell ; stem of the second posterior longer than the cell ; posterior cross-vein longer than the mid cross-vein, distant from it more than twice its own length.

*Length*.—5 to 5.5 mm.

*Habitat*. Naini Tal, India (Giles).

*Time of appearance*.—June.

*Observations*.—Lt.-Col. Giles sent me this species.

It is very distinct and can at once be identified by the thoracic ornamentation and the pure creamy-white colour of the basal half of the lower side of the femora. The scales of the

wing are also somewhat different to most *Culices*, for the central scales of the veins are longer than is normally the case.

Lt.-Col. Giles appends the following note to his description of the insect :—

“Essentially a sylvan species, though I have taken a specimen in the verandah. The larvae are found in pools in the course of the (perfectly clean) freshwater surface drainage system,

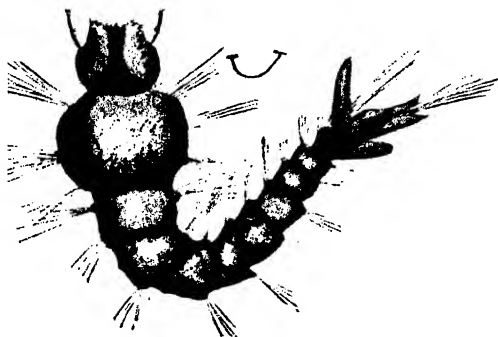


Fig. 173.  
Larva of *Culex pulex*. (After Giles)

through which in heavy rain a perfect torrent of water flows. They are darkly tinted, about 8 mm. long when mature, and have a short spiracle no longer than the last two abdominal segments and but little longer than the anal papillae. The head is yellow at the sides. The pupae are large and nearly black. I have not been able to induce imagines, newly escaped, to bite.”

## 72. *CULEX LATERALIS*. Meigen.

[Syst. Besch. Eur. Zweif. i. 5, 5, Meigen; Spec. Ital. d. Gen. *Culex*; Boll. Soc. Ent. Ital. (1872), Rondani; Fn. Austr. ii. 629, Schiner; Dipt. Neer. 328, Van der Wulp.]

(Fig. 87, Pl. XXII.)

Thorax black, covered with bronzy-brown scales, with a narrow median white line and broad white lateral lines, contracted about the middle of the mesonotum, numerous pale scales in front of the scutellum. Abdomen dusky-black, with basal lateral white patches. Legs with pale coxae and bases to the femora, knee spot white, remainder dark brown. Halteres nearly white.

♀. Head black, with creamy spindle-shaped scales in the middle and forming a row behind, pure-white ones at the sides, black curved ones between on the occiput, a few long forked ones dotted about, mainly ochraceous in front and black behind, a small pale patch just in front projecting between the eyes; border of the eyes with a narrow white rim; antennae dark brown, basal joint very dark brown; proboscis black; palpi rather long, covered with black scales which have metallic violet reflections.

Thorax black, covered with bronzy-brown narrow curved scales on the dorsum, with a narrow median line of creamy-white scales, the sides of the mesonotum with broader white curved scales, forming a broad white lateral line, contracted about the middle of the mesonotum, and numerous pale scales in front of

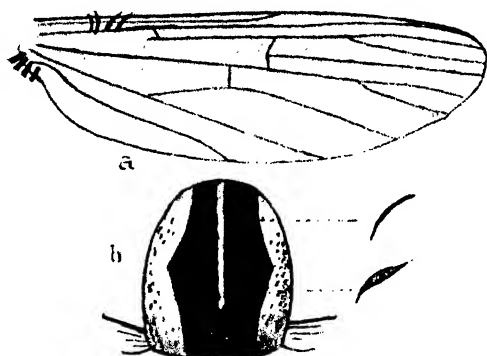


Fig. 174.

*Culicis lateralis*. Meigen.

a, Wing of ♀; b, thorax and enlarged scales.

the scutellum and golden hairs over the roots of the wings; scutellum dark brown, with white curved scales, six large golden-brown bristles on the border of the mid lobe and others on the lateral lobes; metanotum deep black; pleurae black, with eight or nine distinct large patches of snow-white scales.

Abdomen steely-black, covered with dusky-black scales, each segment with basal lateral patches of white scales; first segment with numerous white scales on each side and some dusky ones near its posterior border; posterior borders with dull to golden-brown hairs; venter brown, with basal white scales.

Legs black, coxae brown, with patches of white scales; bases of the femora and ventral surface for about half their length white, apex of the femora with a pure snow-white spot; tibiae

and metatarsi with black bristles; hind metatarsus about two-thirds the length of the hind tibia; in certain lights the legs have a pale bronzy sheen.

Wings with the veins with long lateral brown scales, truncated at the apex; those along the costa and base of the first long vein black; first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior, its stem about equal to half the length of the cell; stem of the second posterior nearly equal to the length of the cell; posterior cross-vein rather more than twice its own length distant from the mid cross-vein; fringe dark brown; basal lobe of wing with a fringe of flat black scales, and near the base of the first long vein are a few bristles.

Halteres with a pale yellowish-white stem and the knob covered with small flat white scales.

*Length*.—6.5 mm.

*Time of capture*.—July, in England.

*Habitat*.—England (Verrall and Stephens), Austria (Meigen), and Russia (Gimmerthal).

*Observations*.—What I take to be this species is very distinct in appearance, the thoracic ornamentation being very characteristic, but like *C. ornatus*. Rondani's *C. albopunctatus*, found in Italy, is said to be the same species; but I fancy it is quite distinct.

*C. lateralis* comes very near Walker's *C. obturbans* and Giles's *C. pulchreinter*, but differs in thoracic ornamentation, &c. Between it and *C. ornatus*, Meigen, there is not much difference; the latter has basal white bands to the segments, whereas *C. lateralis* has only basal white spots.

### 73. *CULEX UNCUS*. n. sp.

Thorax chestnut-brown, with tawny and black scales and a few lateral pale ones. Abdomen brownish-black, with basal white patches, which extend in some cases nearly across the segments, to form incomplete bands. Clypeus very blunt and broad. Legs dark brown, except the ventral surfaces of the femora, which are pallid.

♀. Head clothed with curved scales in the middle, a small patch of creamy scales at the sides, and a narrow pale border round the eyes, with three or four short black bristles projecting forwards, and with two or three longish ones projecting from



the middle; eyes black; clypeus chestnut-brown, bluntly truncate; antennae brown, with pale pubescence and dusky verticils, basal joint and base of the second joint bright yellowish-brown; palpi black, with black bristles; proboscis black, slightly pale at the tip.

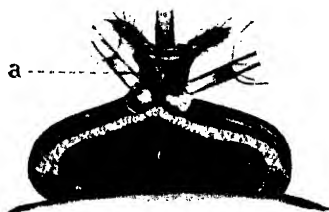


Fig. 175.  
Head of *Culex uncs.* n. sp.  
a, Clypeus.

Thorax chestnut-brown, with scattered curved tawny and black scales, a few pale ones at the sides, and with two median rows of bristles and dense lateral ones towards the posterior of the mesothorax; scutellum steel-black, darkest towards the edge, with black bristles; metanotum light brown, with a purplish tinge beneath the scutellum; pleurae chestnut-brown, with patches of white and pale ochraceous scales.

Abdomen covered with blackish-brown scales, which show purple reflections in some lights, with deep ochraceous ground colour where partly denuded; posterior borders of the segments with longish bristles; first segment ochraceous, with two diffuse patches of purple-brown scales; laterally each segment has a patch of white scales basally situated, but extending in some nearly across the segments; venter banded with white scales.

Legs black throughout, except the ventral sides of the femora, which are pale scaled.

Wings brown scaled; first sub-marginal cell a little longer and scarcely narrower than the second posterior cell; stem of the latter longer than the cell; posterior cross-vein distant from the mid cross-vein about its own length. Halteres pale, with dusky hook-shaped knob.

*Length*.—4 mm.

*Time of capture*.—September.

*Habitat*.—Selangor (Butler, 28, 10, 1899).

*Observations*.—Described from two ♀'s taken by Mr. Butler amongst plantains in Klang jungle. Easily identified by the blunt broad clypeus.

74. *CULEX SUBALBATUS*. Coquillett.

(Proc. U. S. Nat. Mus. vol. xxi. p. 302 (1899).)

“♀. Head and its members black, except the basal half of the second antennal joint, which is yellow; the first joint, and the occiput next the eyes, covered with white tomentum; proboscis curved downwards towards its apex. Thorax brownish-black, the sides and several spots on the pleura covered with white tomentum, a tuft of black hairs above the insertion of each wing; scutellum, metanotum, and posterior angles of the thorax yellowish-brown. Abdomen brownish-black, thickly covered above with black tomentum, the under side of each segment bearing a fascia of silvery-white tomentum, which is prolonged upon the sides of the segments. Coxae yellowish-brown, the anterior sides of the front ones and the outer sides of the middle and hind ones covered with silvery-white tomentum; femora black, sometimes more or less yellowish-brown, the under sides of the front and middle ones encroaching upon the posterior sides, also the under sides of the hind ones encroaching both on the anterior and posterior sides, covered with silvery-white tomentum; tibiae and tarsi black; inner claw of the front tarsi slightly longer than the outer one, and provided with a tooth on the under side, the outer claw destitute of such a tooth. Wings hyaline. Halteres yellow, the knobs brown.

*Length*, excluding the proboscis, 7 mm. Six specimens (No. 641).

*Type*.—No. 3962, U. S. N. M.

*Habitat*.—Japan.”

NOTE. —Coquillett describes this as a ♀. He states that the fore unguis are unequal, one unserrated and the other simple. This is the only instance I can find of such a character in a ♀ *Culex*. All the three hundred odd species I have examined have always equal unguis in the ♀, and are always both unserrated or both simple. The ♂'s, however, have the unguis as described by Coquillett. It is certainly a distinct species, and did not occur in the small collection received by the Museum from Tokyo.

75. *CULEX ATRATUS*. n. sp.\*

(Fig. 135, Pl. XXXIV.)

Thorax deep umber-brown to almost black. Abdomen black, sometimes with a dull coppery-brown sheen, each segment with small lateral basal white spots, most distinct on the apical

\* This and a few other species must be removed from *Culex* and form a new genus, the arrangement of the wing scales being very characteristic.

segments; venter with broad, apical, creamy bands. Legs dark brown to almost black, except at the base; a pale knee spot, and another at the tibio-metatarsal joint. Fore and mid ungues of the ♂ unequal, the larger with a long median tooth, the smaller with a sharp basal tooth; hind equal and simple.

♀. Head with creamy-white curved scales in the middle, pale flat ones at the sides, and with numerous black forked upright ones, which expand out very much at the top; proboscis black scaled, thickened towards the tip, apex pale; palpi short, black scaled; antennae brown, with pale pubescence, basal joint and base of the second joint testaceous; eyes deep black, purplish in some lights, a narrow pale border surrounding them.

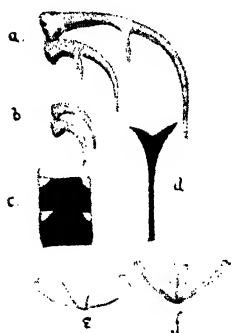


Fig. 176.

*Culex atratus*, n. sp.

- a, Male unguis of fore leg;  
b, female unguis; c, abdominal segments; d, forked scale of head;  
e and f, wing scales.

Thorax deep umber-brown to black, covered with narrow, deep-brown, curved scales, and with two rows of long black bristles, and with numerous black bristles at the sides; scutellum dark ochraceous-brown, with narrow dark scales and black bristles; metanotum brown; pleurae paler, with a row of black bristles down to the mid coxae.

Abdomen covered with deep black scales, and each segment with a small basal whitish spot on each side, which does not show dorsally on all the segments; posterior borders with golden bristles; in some specimens the abdomen has a coppery-brown appearance, and the lateral spots are only present on the last few segments; venter

with broad basal bands of creamy scales and a few dusky ones forming apical bands to the segments.

Legs black, coxae grey, and also the ventral surface of the femora, except just at the apex; apices of the femora and tibiae swollen; a small pale spot at the tibio-metatarsal joint, and a small indistinct deep-yellow one at the knee; legs rather long; they also show a deep bluish tinge in some lights.

Wings a little longer than the body, with dark blackish-brown scales, very dense and broadish on the first, second, third, and apical portions of the fourth veins; the stem of the fourth, the upper arm of the fifth and the sixth with long thin scales on each side in addition; the lower branch of the fifth with thin scales on one side only, and the stem with no long scales; first

sub-marginal cell considerably longer but the same width as the second posterior cell, more than three times longer than the stem, its base nearer the base of the wing than that of the second posterior cell; second posterior cell with its stem about half the length of the cell; posterior cross-vein about twice its own length distant from the mid cross-vein. Halteres with pale stem, with a dark line down one side, and a fuscous knob.

*Length*.—2.5 to 3 mm.

♂. Head with pale curved creamy scales in the middle, flat dusky and then dirty-white ones at the sides, numerous black upright forked scales as in the female, but leaving a bare line in the middle of the head, and more dense on each side of it; palpi and proboscis blackish-brown, with steely metallic reflections in some lights; palpi not quite as long as the proboscis, the antepenultimate joint much expanded at the apex; penultimate joint longer than the apical joint; antennae banded dark brown and dirty-white; plumes of antennae and palpi blackish-brown.

Ungues of fore and mid legs unequal, both with a tooth, that of the smaller very pointed and near the base; hind unguis equal.

*Length*.—2.5 to 3 mm.

*Habitat*.—Jamaica (Dr. Grabham, 8, 2, 1900, and F. Cundall, 7, 12, 1899); Trinidad (Urich).

*Time of capture*.—November and December.

*Observations*.—A small dark mosquito, which is clearly distinct, and which has very characteristic wing scale-ornamentation, which should at once enable the collector to identify it. The swollen proboscis in the ♀ is also a marked character; so also are the swollen apices of the tibiae. Dr. Grabham states that it is the usual swamp form. "I strongly suspect," he says, "the male sucks blood, but have not made definite observations yet." (Sign attached to label X.) Taken by Dr. Grabham (who appends the following note) at Ferry Swamp, in the larval stage: "from stagnant algae-containing permanent pools. The larvae feed on algae."

In a recent letter Dr. Grabham writes: "The small swamp form, a terrible pest in local mangrove swamps; the minnows do not seem to destroy this species." The larvae and pupae received from him will be described in Vol. III.

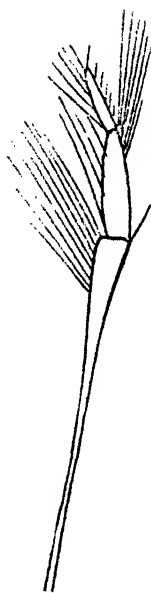


Fig. 177.

*Culex atratus*, n. sp.  
Male palpus.

76. *CULEX ATRIPES*. Skuse.

(Proc. Linu. Soc. N. S. Wales, p. 1750.)

"Thorax (when denuded) glistening black, with light bronze scales; prothoracic lobes, pleurae and an oblong spot before the origin of the wings silvery. Abdomen violet-black; each segment with a white lateral patch; venter densely silver scaled. Legs violet-black, coxae silver scaled, femora dusted on their basal half with pale scales, which have a bronzy reflection in certain lights; hind metatarsi nearly one-seventh longer than the hind tibiae; first sub-marginal cell much longer and scarcely narrower than the second posterior cell; posterior cross-vein about twice its length distant from the mid cross-vein. Head densely violet-black scaled; eyes bordered with a narrow silvery line."

*Length*.—3·81 mm.

*Habitat*.—Holmbush (Masters); Sutherland and Knapsack Gully, New South Wales (Skuse).

*Observations*.—A small species, very like the species here described as *Uranotaenia pygmaea*, but clearly differs in the venation. Skuse, with his usual thoroughness, would have mentioned the enormously developed mid femora seen in the *Uranotaenia*.

77. *CULEX CINEREUS*. n. sp.

(Fig. 111, PL. XXVIII.)

Thorax covered with dense grey scales. Abdomen dusky-black, the segments with lateral white patches, which are more or less connected to form a white lateral line. Legs dark brown, pale beneath, femora white, coxae pure white.

♀. Head covered with grey scales, slightly darker behind; eyes black, but showing some coppery hues above, bordered with a thin pure-white line; palpi dark brown, except the extreme tip, which is white; proboscis dark brown; antennae brown, as long as the proboscis.

Thorax covered with dense grey scales, with some long, black, backwardly projecting bristles, especially at the sides just behind the neck and on the edge of the scutellum, where there are dark reddish-brown bristles, apparently eight in the middle lobe and three on either side; metanotum dusky brown; when viewed in certain directions three pale reddish-brown lines will be seen on the dorsum; pleurae grey, with distinct patches

of white scales, one between the wing and haltere on each side ; slightly ferruginous around the root of the wings.

Abdomen dusky-black, first segment with thickly grouped golden hairs laterally, all the segments bordered with a row of pale golden hairs, last segment slightly ferruginous, densely hairy ; laterally the posterior edges of the segments are white, the bases of the white areas being connected, and forming a more or less perceptible white lateral line ; ventral surface with white scales and pale hairs.

Legs dark brown above, white scaled below, especially the femora ; coxae pure white, tibiae very dilated apically.

Wings with the veins covered with brown scales, which along the costa and first long vein are very dark ; first sub-marginal cell longer and narrower than the second posterior cell, stems of

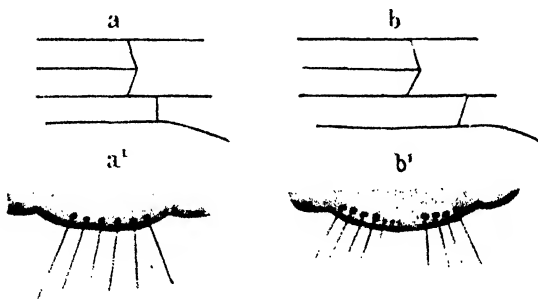


Fig. 178.

a. Cross-veins, and a', scutellar bristles of *C. nigrochaetæ*; b and b', of *C. cinereus*.

both short ; posterior cross-vein considerably more than its own length distant from the middle cross-vein.

Halteres with pale yellowish stems and clear dull white knobs.

*Length*.—6 to 6·5 mm.

♂. Thorax, head, and abdomen similar in colour to the ♀, but the abdomen has the penultimate segment covered dorsally with snow-white scales, forming a white apical spot. Antennae banded black and white, with dark brown verticils. Proboscis dark brown, black towards the tip, and with two black spots at the base ; palpi longer than the proboscis, dark brown. Halteres in some specimens with a dusky knob, in others all pale.

*Length*.—6 to 6·5 mm.

*Habitat*.—Freetown, Sierra Leone (E. Austen, 8, 1899, and 9, 1899).

*Observations*.—Described from a series of ♂'s and ♀'s brought over by Mr. Austen. It is a very distinct species, easily told by its grey-scaled thorax and dusky-black abdomen with white lateral spots. Mr. Austen appends the following note to this species: "When at rest the wings of the ♂'s of this species overlap at the tip, and so seem to taper to a point. Male and female are nearly always found in close proximity, resting on whitewashed walls."

78. *CULEX NIGROCHAETAE*. n. sp.

Thorax blackish, densely covered with narrow curved fawn-coloured scales with a dark median line when denuded and black bristles; metanotum pale chestnut-brown; abdomen dusky-black, with a few white lateral scales; legs dark brown, unbanded.

♀. Head dark brown, with dusky-grey scales and a narrow white border round the eyes and a few deep-grey upright scales and some apparently small flat ones scattered about, as well as dull ochraceous curved ones; eyes black, silvery and purple, projecting over the eyes are a few dark bristles; clypeus chestnut-brown; proboscis deep black, testaceous at the tip; palpi black, densely scaled, apical joint mamilliform, penultimate joint large; antennae deep brown, basal joint dark brown, with grey tomentum around its edge, base of the second joint testaceous.

Thorax pale brown, with darker median lines, densely covered with narrow curved fawn-coloured scales with a median and two lateral rows of parallel black bristles; over the roots of the wings another row of black bristles, very thick, which run down to the scutellum; scutellum pale ochraceous, with narrow curved pale scales and darker lateral lobes; median lobe with six golden bristles; metanotum pale ochraceous-brown; pleurae ochraceous-brown.

Abdomen deep shiny black, covered with olive-brown and deep grey scales, each segment with pale border-bristles and some white scales laterally; the abdominal scales show dull green, greyish-blue and dull coppery reflections under the microscope; there are also numerous lateral pale hairs which curve over the venter; venter black, with grey and white scales and numerous pale hairs; traces of white apical scales may be seen at the sides of the anterior segments.

Legs brown; coxae pallid; femora ochraceous, with brown scales; tibiae and tarsi deep brown; ungues of fore and hind legs equal, small and simple.

Wings rather dusky-brown; the costal border, sub-costal and first long veins with dark brown rather broad scales, showing violet reflections, remainder of the wings with brown scales of typical *Culex* form; first sub-marginal cell longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the second posterior cell, about two and half times the length of its stem; stem of the second posterior about three-fourths the length of the cell; posterior cross-vein about its own length distant from the mid cross-vein, base of the wings testaceous. Halteres with a pale stem and deep fuscous knob.

Length.—3.5 mm.

♂. Head dark brown, with narrow curved grey scales, upright thin brown ones and small flat ones round the eyes;

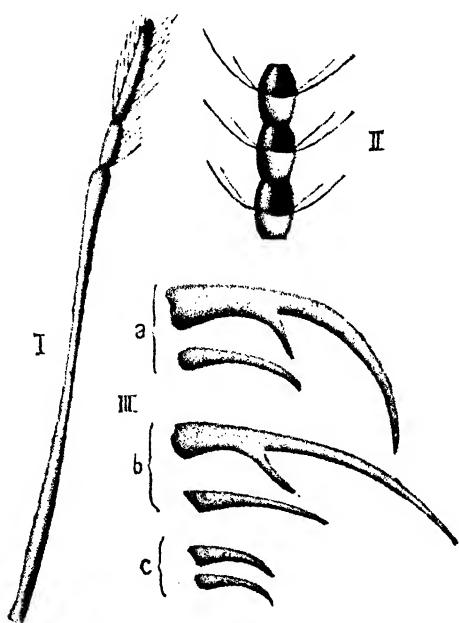


Fig. 179.

*Culex nigrochaetae*, n. sp. (♂).

I. Male palpus; II. joints of antenna; III. male ungues.

clypeus, palpi and proboscis deep brown; second joint of palpi short, about half the length of the apical joint, apical joint with



a few black bristles; antennae brown, broadly banded with grey, verticillate hairs arising from the middle of the joints, that part of the joints above the hairs brown, that part below grey. Thorax much as in the ♀. Abdomen thin, deep brown to the naked eye; deep ochraceous with deep dull violet scales under the microscope; genitalia testaceous. Fore unguis unequal, the larger unserrated, curved, the smaller simple; in the mid legs the larger unserrated one is nearly straight; hind unguis small, equal, simple.

*Length*. — 3.5 mm.

*Habitat*. — Lagos (Dr. Strachan) (91).

*Observations*. — Very like *C. cinereus*, mihi, but the posterior cross-vein is much nearer the mid cross-vein than in that species; the abdominal scales are more of a grey and green hue under the microscope, the femora are not white beneath and the mid scutellar bristles are only six in number, not eight as in *cinereus*, and it is also much smaller in size.

#### 79. *CULEX PSEUDOCINEREUS*. n. sp.

(Fig. 112, Pl. XXVIII.)

Thorax grey, with three indistinct, dusky, longitudinal lines; covered with narrow, curved, grey scales; abdomen unbanded and unspotted, deep dusky brown, the junctions of the segments rather testaceous, giving a quasi-banded appearance; venter dark brown. Legs unbanded, dark brown, bases and venter of femora pallid; fore and mid unguis of the ♂ very unequal, unserrated, the larger with a long tooth; hind unguis equal, simple, small.

♂. Head brown, covered with narrow, curved, pale grey scales, and with a broad white border round the eyes, spreading out laterally, and with numerous small black upright-forked scales; antennae grey, with narrow brown bands and brown verticillate hairs; proboscis black; palpi a little longer than the proboscis, dark brown, the penultimate joint very short, not more than one-third the length of the apical joint, the latter with a few long brown hairs on each side, the former also with a few thinner ones, the long antepenultimate joint with some very short thick bristles on the apical half and a narrow pallid band on the basal half, its base expanded; eyes silvery and black.

Thorax grey, showing in some lights three darker longi-

tudinal lines; covered with scattered, pale grey, narrow curved scales, with a yellowish tinge and with three rows of black bristles; scutellum greyish-brown, with narrow curved grey scales and with six golden-brown bristles to the median lobe; metanotum dark brown; pleurae deep greyish-black, with a broad line of white scales running down to the base of the middle leg and another smaller patch on the metapleura.

Abdomen narrow, expanded apically, covered with deep brown to dusky-black scales, which are scanty at the bases of the segments, giving a bright ferruginous-banded appearance, owing to the ground colour showing through; posterior borders of the segments brown, hairs longest laterally; the sides of the abdomen with long brown pubescence; apex of the last segment and genitalia rather ferruginous; venter brown.

Legs dark brown: coxae ochraceous, with pale scales; femora pale ochraceous at the base and ventrally; unguis of the front and mid legs unequal, both toothed; of the hind equal and simple.

Wings with the veins covered with brown scales; fringe brown; first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the second posterior, its stem a little more than half the length of the cell; stem of the second posterior cell longer than the stem of the former, and about the same length as the cell; posterior cross-vein twice its own length distant from the mid cross-vein. Halteres with a dull ochraceous stem and fuscous knob.

*Length*.—4·8 mm.

*Habitat*.—Salisbury, Mashonaland (Marshall) (79).

*Time of capture*.—February.

*Observations*.—Described from a single ♂ sent by Mr. Marshall. It is very near *C. cinereus*, mihi, but is smaller, and differs in not having any lateral white abdominal spots, the absence of the white apical spot and the dark venter. It is also like *C. nigr.chaetae*, but the unguis of the ♂ again separate it.

80. *CULEX METALLICUS*. n. sp.

(Fig. 102, Pl. XXVI.)

Thorax black, with long curved hair-like silvery scales on the anterior half and long bright brown ones behind. Abdomen flat, smooth, with metallic purple scales. Legs brown, unbanded;

ungues of the ♀ rather long, equal and simple; of the ♂ unequal in the fore and mid legs, equal in the hind. Wings thickly scaled along the veins and with lateral long scales, dark along the costal border.

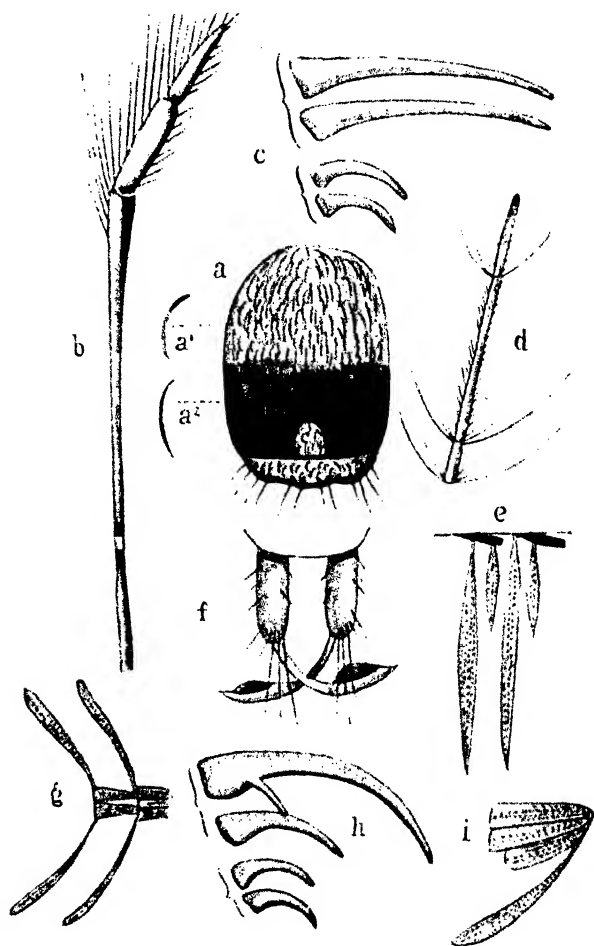


Fig. 180.

*Culex metallicus*. n. sp.

a, Thorax; a¹ and a², scales; b, male palpus; c, female unguis; d, apex of antennae; e, wing fringe; f, male genitalia; g, wing scales; h, ♂ unguis; i, another form of wing scales.

♀. Head dark brown, with a few scattered narrow pale grey curved scales and numerous long black upright-forked ones over the whole surface; eyes black and coppery; a few golden-

brown bristles projecting between them; clypeus, palpi and proboscis brown, the last two with brown scales and metallic reflections; antennae brown, second joint rather ferruginous.

Thorax black, the anterior half clothed with long silky creamy curved hair-like scales, the posterior half with similar scales only bright rich brown; scutellum ochraceous-brown; the mid lobe with four black border-bristles; the lateral lobes with six large and a few small bristles; scales on the scutellum small, curved and pale; metanotum deep brown; pleurae black, with some brilliant white scales.

Abdomen brown, ochraceous at the base, clothed with metallic purple scales, with dusky hairs which become golden at the apex; first segment ochraceous with dusky median scales.

Legs deep brown; ochraceous-yellow at the base and on the base and venter of the femora, with an ochraceous tinge in some lights along the whole length of the legs; unguis of the fore and mid legs equal, long, simple, nearly straight, of the hind legs equal, small and curved.

Wings with rather long median scales to the veins and long thick lateral ones ending convexly; first sub-marginal cell longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the latter, its stem not quite half the length of the cell; stem of the second posterior cell half the length of the cell; posterior cross-vein about twice its own length distant from the mid cross-vein; fringe brown, border-scales long, dark brown; halteres with a deep ochraceous brown stem and fuscous knob.

*Length.* ---4.5 to 4.8 mm.

♂. Palpi dark brown, with the trace of a pale band towards the base, penultimate joint a little longer than the apical joint, both with long thick black bristle-like hairs on one side, apex of the long antepenultimate joint swollen, also with black bristles; antennae banded brown and white, the white bands very broad; penultimate joint long, thin, only slightly pubescent; proboscis deep brown.

Thorax like the ♀, only the pale scales in front are golden instead of silvery white.

Abdomen ochraceous with brilliant purple scales; genitalia brown, the claspers swollen towards the apical half, dark brown; unguis of the fore leg black, unequal, the larger one uniserrated at the base; hind unguis equal and simple.

*Length.* ---4 mm.

*Habitat*.—Bonny, West Africa (Annett).

*Time of capture*.—July.

*Observations*.—Described from two ♀'s and a ♂ sent me by Dr. Annett, the ♀'s in perfect condition. It is a very pretty distinct *Culex*, resembling to some extent the members of the genus *Janthinosoma*, but the legs are not densely scaled, and can thus easily be told from species of that genus. The thoracic ornamentation resembles *C. gelidus*, but the thoracic scales are much longer in form, and the metallic purple abdomen will at once separate it from that species. The specimens were taken in the "bush near the cemetery" at Bonny. I have only placed it provisionally in the genus *Culex*.

# 81. CULEX FRENCHII. n. sp.

Thorax deep bright chestnut-brown, with pale golden scales scattered over its surface, three double rows of black bristles, two median bare lines and a curved bare patch on each side of the mesonotum. Abdomen dusky black, unbanded, venter yellowish. Legs with pale coxae and bases to the femora, knee spots orange, rest dark brown, with dull ochraceous reflections. Wings especially dark along the costal border.

♀. Head dark brown, covered with a few curved pale creamy scales, golden upright-forked ones in the middle, and forked black ones over the whole surface; palpi rather long, black, testaceous at the base; clypeus brown; proboscis black scaled; antennae dark brown, with testaceous yellow basal joint and base of the second joint; pubescence pallid, hairs black.

Thorax deep bright chestnut-brown, with scattered pale golden curved hair-like scales and three double rows of black bristles, with two median bare lines, and a curved bare patch on each side commencing about the middle of the mesonotum; scutellum bright testaceous, with eight bristles to the central lobe, numerous ones on the lateral lobes, and with scattered curved pallid scales; metathorax reddish-brown; pleurae bright brown, with patches of pale scales, not very distinct, paler beneath the roots of the wings; numerous black bristles between the pleurae and the mesonotum.

Abdomen pale steely colour and ochraceous, densely clothed with dusky purplish-black scales, no trace of banding, posterior borders of the segments with golden hairs and also with lateral golden hairs apically, last segment testaceous; venter clothed

with yellowish scales; first segment ochraceous, with numerous long hairs.

Legs with pale ochraceous coxae; femora pale at the base and pale yellowish beneath on the basal half, dark brown above, apex orange; tibiae, metatarsi, and tarsi dark brown, almost black, with ochraceous reflections below in some lights; hind metatarsi about one-third shorter than the tibiae.

Wings clothed with dark brown scales, especially dark along the costal edge; first sub-marginal cell very much longer and a little narrower than the second posterior cell, its base much nearer the base of the wing than that of the latter, its stem rather more than one-third of the length of the cell, considerably shorter than the stem of the second posterior cell, which is not

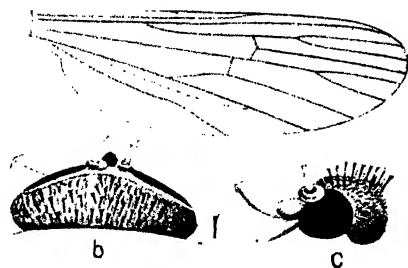


Fig. 181.

*Culex Frenchii*, n. sp.

Wing of ♀; b, head (dorsal view); c, lateral

quite so long as the cell; posterior cross-vein distant from the mid cross-vein about its own length.

Halteres ochraceous.

Length.—5 mm.

Habitat.—Victoria (French) (26. 6. 1900).

Observations.—Described from four specimens (♀) sent by the Governor of Victoria and collected by Mr. French from the islands of Victoria. In some respects they resemble *C. occidentalis*, but they can be distinguished by the different head ornamentation and by the absence of abdominal and leg banding. The pale-scaled head is strongly contrasted against the deeper brown thorax. It is the only species so far recorded from Australia with unbanded legs and unbanded abdomen. The golden border-hairs however give it a semi-banded appearance in some lights.

82. *CULEX LONGIPES*. n. sp.

Thorax dark chestnut-brown, with curved black scales, more or less longitudinal ornamentation and long black bristles; pleurae pale brown to grey with long black bristles. Abdomen dusky black, unbanded, venter yellowish. Legs long, dark brown; coxae and venter of femora pale. Fork-cells of wing short.

♀. Head dark brown, with white borders round the eyes formed by silky-white scales, the dark central portion of the head with curved black scales and scattered long black upright forked ones; six long brown bristles pointing forwards, three on each side and two smaller ones in the middle; eyes black and silver; palpi dark brown; clypeus chestnut-brown; proboscis black, brown at the apex; antennae brown, with brown pubescence and verticils, basal joint testaceous.

Thorax deep chestnut-brown, with curved black scales and a few pallid ones and with long black bristles, with more or less longitudinal ornamentation; scutellum chestnut-brown, with apparently five central bristles and four on each lateral lobe; metanotum chestnut-brown; pleurae pale brown to grey, with numerous black bristles, above the legs very pallid; sternum pallid grey.

Abdomen entirely covered with deep dusky purplish-black scales, the posterior borders of the segments edged with brown (in some lights rather golden) hairs; first segment pale ochraceous-brown, with numerous long bristles; venter yellowish.

Legs long, coxae very pale grey, remainder very dark brown, except femora, which are pale beneath; unguis equal, very small.

Wings with brown scales; the fork-cells short, the first sub-marginal longer, but about the same width as the second posterior cell, stem of the former equal to about half the length of the cell; stem of the second posterior cell equal to the length of the cell; posterior cross-vein longer than mid cross-vein and distant from the latter about twice its own length.

Halteres with pale brown stem and deep fuscous knob.

*Length.* - 4.3 mm.

*Habitat.* - Singapore (R. Hanitsch) (4. 9. 99).

*Time of capture.* - July (27th).

*Observations.* - A very distinct species with long legs, the hind ones reaching 8.5 mm. and the front 7.5 mm.

A single specimen sent, in which the thorax is partly denuded, but it can at once be told by its long legs and extremely pale thoracic sides and sternum, and its brown thorax and dark abdomen, which is unbanded.

The single specimen sent was taken in a house near Singapore.

### 83. *CULEX FREETOWNENSIS*. n. sp.

Thorax dark brownish-grey, with long greyish scales, with three lines of black bristles. Abdomen deep dusky brown, with small lateral patches of white scales on the apical borders of the segments; venter pale, ochraceous when denuded. Legs deep brown, with rather a coppery sheen, coxae, bases of the femora and their ventral surfaces pale grey; ♀ unguis equal and simple; fore and mid unguis of the ♂ unequal, uniserrated, the fore nearly straight, the smaller only a little shorter than the larger; the mid more unequal, the larger one curved; hind unguis equal and simple, small.

♀. Head brown, with a border of brownish-white scales around the eyes, pale scales over the occiput, with numerous scattered dark upright forked ones; eyes black and golden; proboscis black, slightly paler at the tip; palpi black; antennae entirely black with pale pubescence.

Thorax dark brownish grey, with longish grey scales backwardly directed, with two long lateral rows of black bristles and a median one ending in the middle of the metanotum brown; scutellum with six or seven brown bristles on the mid lobe and several on the lateral lobes; long black bristles over the roots of the wings; pleurae with patches of white scales.

Abdomen covered with deep dusky-brown scales; on the apical borders are small lateral patches of white scales; the first segment dark brown; venter when denuded ochraceous.

Legs with the coxae pallid, and also the under surfaces of the femora and their bases, the remainder of the legs dark

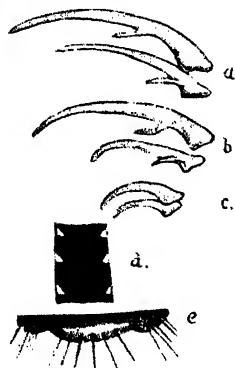


Fig. 182.

*Culex Freetownensis*. n. sp.

a, b, c, Ungues of the male;  
d, abdominal segments  
e, scutellum.



brown, with a metallic coppery lustre in some lights. Ungues equal, small, simple.

Wings with the veins covered with brown scales; first sub-marginal cell a little longer but about the same width as the second posterior cell, its base a little nearer the base of the wing than that of the second posterior cell; its stem about equal to half the length of the cell, a little shorter than the stem of the second posterior cell; posterior cross-vein distant rather more than its own length from the mid cross-vein; halteres with a pale stem and fuscous knob.

*Length*.—4.5 mm.

♂. Head with distinct white border round the eyes; proboscis deep brown with paler apex; palpi deep brown, with scanty black hair-tufts; antennae banded brown and grey, with the plumes deep silky brown.

Abdomen with small apical and lateral patches of white, and in one specimen the last segment entirely white scaled; on the venter are numerous pale scales. The posterior cross-vein is distant nearly twice its own length from the mid cross-vein; when examined in certain directions, three dark longitudinal lines may be made out on the thorax.



Fig. 183.

*Culex Freebornensis*, n.sp.  
Wing of ♂. (X. 9.)

Ungues of front legs nearly equal, the larger with a distinct tooth, the smaller with a small pointed tooth near base; mid unguis unequal, but both toothed; hind ones small and simple, equal.

*Length*.—4.5 to 5 mm.

*Habitat*.—Sierra Leone (Austen), (8. 1899 and 99. 267).

*Time of capture*.—August and September August 15th to September 1st.

*Observations*.—This species nearly approaches *C. dissimilis*, but the white lateral scales on the apical borders of the segments should easily separate it. Although it resembles *C. masculus*, it can be told from it by the absence of basal banding on the abdomen, and by the different structure of the unguis, which are very characteristic.

84. *CULEX LUTEOLATERALIS*. n. sp.

(Fig. 108, Pl. XXVII.)

Thorax deep purplish-black, with a broad lateral yellow to orange line on each side, the darker median portion with dull yellow and brown scales. Abdomen deep brown, with basal, creamy-yellow bands. Wings in the ♀ with yellow and brown scaled veins.

♀. Head dark brown, with narrow curved golden-yellow scales in the middle, flat ochraceous and dusky ones at the sides, with a few dull upright forked ones, and a tuft of golden bristles projecting between the eyes; eyes large, black and silvery; palpi orange scaled at the base, black at the apices; antennae brown, basal joint and the second joint testaceous, the second joint rather swollen; proboscis almost black; clypeus black.

Thorax deep black, with broad line of bright orange-yellow scales on each side of the mesonotum; the dark central portion has also a few scattered golden scales amongst the narrow, dull brown ones, especially in the middle of the dorsum; black bristles just before the root of the wings, and golden ones over the roots; scutellum black, with a few narrow pale golden curved scales and pale border-bristles; metanotum deep purplish-black; pleurae dark brown, with a few pale scales and dark bristles.

Abdomen black, covered with dusky-black scales and with basal bands of dull creamy-yellow scales, the first segment with pale median scales; posterior borders of the segments with pale golden border-bristles; there are also small lateral basal pale spots; venter dusky.

Legs dull ochraceous, covered with brown scales, the ground colour showing in the femora, especially at the bases and on the under sides; femora, tibiae and metatarsi spiny, the hind metatarsi not quite as long as the hind tibiae; femora rather swollen; fore and mid unguis equal, uniserrated; hind equal and simple, nearly straight.

Wings with the veins clothed with black and yellow scales as follows: black scales on the costal border on all the third long vein, on the branches of the fourth and to some extent on the sixth long vein, the remainder mostly dull yellow scaled, with a few darker ones on the veins in places; fringe dusky, also the

border-scales; first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter; its stem less than one half the length of the cell; stem of the second posterior cell nearly as long as the

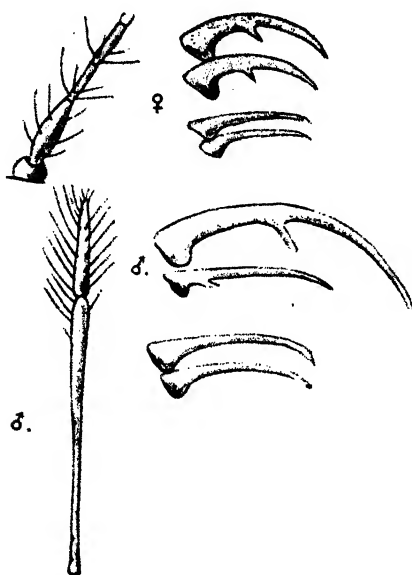


Fig. 184.

*Culex luteolateralis*. n. sp.

Base of ♀ antenna and fore and hind unguis;  
♂ palpus and fore and hind unguis.

cell; posterior cross-vein rather more than its own length distant from the mid cross-vein. Halteres with half the stem pale yellowish, the rest and the knob deep purplish-black, the knob densely scaled.

*Length*.—3.5 to 4 mm.

♂. Head much as in the ♀, but with rather more golden scales on the occiput; palpi much longer than the proboscis, entirely brown; the last two joints have fused into one, so that the palpi are really only two-jointed, unless we count a basal constriction; the last joint has dense black, long and thick bristle-like hairs, a few of which also arise from the preceding joint, the whole densely covered with brown scales; proboscis dark brown; antennae banded brown and grey, with dense brown plumes.

Abdomen dusky black, the second to sixth segments inclusive

with creamy-yellow basal bands, the last segments with a dull brassy tinge; densely hairy.

Legs, especially the mid and hind pair, with the femora, tibiae, and metatarsi bristly; fore unguis very unequal, the larger curved, the smaller nearly straight, the former with a large tooth towards the middle, the smaller with a small one near the base; hind unguis equal and simple.

*Length*.—4.5 to 5 mm.

*Habitat*.—Durban (Christophers) (13. 2. 1899); Salisbury, Mashonaland (Marshall) (79); Straits Settlements, Perak (Wray) (22. 11. and 21. 12. 1899).

*Time of capture*.—January in Durban; March in Mashonaland.

*Observations*.—Evidently a widely distributed mosquito, for it certainly occurs in the Malay Peninsula, as well as in Africa. It is a very distinct species, readily told by the orange-scaled areas on the mesonotum. The ♂ palpi are very peculiar, and I am not sure that they are not of generic value in this case; in a few other male *Culex* that I have examined the joints have also been so reduced; in the ♀ antennae we likewise see a striking peculiarity in the swollen second joint. It will probably have to be removed to a separate genus from *Culex*.

The ♀ from Perak differs only in having the palpi all black instead of being orange at the base.

#### 85. *CULEX DIVERSUS*. n. sp.

(Fig. 107, Pl. XXVII.)

Thorax with golden-brown curved scales, with two broad, dark median lines, with bright brown scales and two smaller lateral lines posteriorly; abdomen deep dusky-brown, with basal yellow bands expanded at the middle and at the sides into creamy white spots, so as to appear as three spots; legs unbanded.

♀. Head black, with rather large curved scales, small flat ochraceous ones at the sides and with black and golden-brown bristles; antennae black, basal joint black, with a thick mass of yellowish scales on the inside, base of the second joint ferruginous; palpi dark brown, with black scales; proboscis black, with a few yellow scales near the base; clypeus black.

Thorax deep purplish-black, covered with narrow curved yellow scales, with two broad median dark lines and two small lateral dark lines behind, all covered with narrow curved

bright brown scales ; over and in front of the roots of the wings the scales are rather paler and broader ; three rows of black bristles and numerous black and golden bristles over the roots of the wings ; scutellum dark brown, with narrow curved pale scales and a dense posterior border of golden bristles ; meta-thorax deep brown ; pleurae dark with dense masses of white and ochraceous scales.

Abdomen of a pale steely colour when denuded, covered with fuscous brown scales with a faint purplish hue, and with basal bands of yellow scales which spread out in the middle and at the sides, where they form lateral triangular creamy spots ; first segment with flat ochraceous and white scales ; the second with a median basal yellow patch and lateral spots ; the penultimate

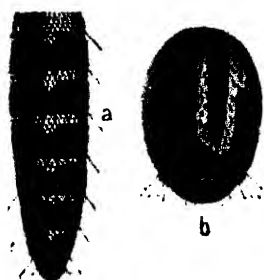


Fig. 185.

*Culex diversus*. n. sp.a, Abdominal ornamentation ;  
b, thoracic ornamentation.

and the last with more or less of a median line and apical pale scales as well as basal ones ; posterior borders with pale golden bristles ; venter almost entirely clothed with pale creamy scales.

Legs with the coxae dark with pale scales ; femora creamy-yellow beneath with scattered dark scales above, except towards the apex, where they are deep blackish-brown, knee spots yellow, large and distinct ; tibiae dark brown, paler beneath ;

metatarsi and tarsi deep blackish-brown to almost black, hind metatarsi not so long as the tibiae ; ungues of all the legs equal, black and with a distinct large tooth on each.

Wings large ; the veins covered with dark brown small median scales and paler long thin lateral ones, except the greater part of the fifth and whole of the sixth long vein, where the long lateral scales are absent ; fork-cells rather short ; first sub-marginal cell longer and narrower than the second posterior cell, its stem slightly shorter than the cell, equal in length to the stem of the second posterior, which is about equal in length to the cell, the forks of which widely diverge ; the posterior cross-vein about half its own length distant from the mid cross-vein and sloping towards the base of the wing ; supernumerary and mid cross-veins in almost a straight line ; fringe brown ; halteres ochraceous, with pale scales on the knob.

Length.—6·5 mm.

*Habitat*.—England (Tunbridge Wells, Kent).

*Time of capture*.—June.

*Observations*.—Described from specimens in Mr. Verrall's collection. A large handsome species, easily identified by the thoracic ornamentation and abdominal banding.

It probably bears some resemblance to Ficalbi's *Culex impudicus*, but can at once be told by the ♀ unguis being uniserrated and large.

### 86. CULEX PUNCTOR. Kirby.

(Fauna Boreali-Americana, Ins. p. 309.)

Thorax deep brown, covered laterally with narrow creamy scales, which form a line on each side passing back to the scutellum, the middle of the mesonotum with deep chestnut-brown scales, with a median double line of pale scales which spreads out in front of the scutellum to form a pale patch. Abdomen blackish-brown, with basal pale bands which spread out laterally. Legs brown; the coxae with brown and white scales. Ungues of the ♂ unequal, the larger toothed, the smaller simple (?); hind ones equal and simple; in the ♀ equal, uniserrated.

♂. Head dark brown, with narrow curved creamy scales, flat narrow pale ones at the sides and numerous creamy upright forked ones; antennae brown, with deep bright brown plumes; proboscis brown; palpi dark brown, with rather deep flaxen-brown hair-tufts; the two last joints nearly equal, the antepenultimate longer, nearly as long as the last two put together.

Thorax deep brown, covered at the sides with narrow creamy curved scales, which form a line on each side passing back to the scutellum; between these two lines the mesonotum is covered with deep bright chestnut-brown, narrow curved scales, there being a narrow median double line of pale scales in the middle separated by a distinct dark bare line; the pale scales of the median lines spread out round the bare patch in front of the scutellum and form a pale patch; there are three rows of dark bristles which become paler posteriorly; the sides of the mesonotum are deep black, with scanty creamy scales; scutellum deep brown, with pale creamy scales and pale brown border-bristles; metanotum deep brown; pleurae black, with a

large patch of white scales at the root of the wings and another at the base of the anterior legs, with a dense tuft of golden hairs springing from it.

Abdomen covered with deep brownish-black scales, the bases of the segments with white bands which spread out laterally, especially on the last three segments; covered laterally and dorsally with flaxen hairs, the lateral ones very long; genitalia deep brown and very hairy.

Legs uniformly deep brown, with sometimes a rather dull purplish tinge, coxae black with white scales; femora slightly paler at the base and ventrally; fore and mid unguis unequal, the larger with a distinct tooth towards the base, the smaller apparently simple, hind ones equal and simple.

Wings with the veins bordered with long narrow scales, the veins bright brown; first sub-marginal cell longer and narrower than the second posterior cell, which is very short and broad, their bases about level; stem of the first sub-marginal equal to the length of the cell; that of the second posterior cell much longer than the cell; posterior cross-vein about its own length distant from the mid cross-vein; mid and supernumerary cross-veins form a distinct angle; fringe brown with grey reflections.

Halteres with ferruginous stem and black knob and a stripe on one side.

*Length*.—6 to 6.5 mm.

♀. Antennae brown, basal joint deep ferruginous; palpi deep reddish-brown.

Wings with the fork-cells short; base of the first sub-marginal cell about half its length distant from the junction of the sub-costal and costal, a little longer and narrower than the second posterior cell, their bases about equal, that of the former rather the nearer to the base of the wing; stem of the first sub-marginal cell equal to rather more than half the length of the cell; stem of the second posterior cell about the same length, equal to about two-thirds of the length of the cell; posterior cross-vein about equal to the mid cross-vein, nearly its own length distant from the latter. Abdomen with basal white bands more uniform than in the ♂. Ungues equal and uniserrated.

*Length*.—6 mm.

*Habitat*.—St. Martin's Falls, Albany River, Hudson's Bay (lat. 65° North).

*Observations*.—The above description is taken from the types in the British Museum, of which two are ♂'s and the

third a ♀. One of the ♂'s is in perfect condition, and the ♀ sufficiently so to enable it to be identified. The original description of this species is, as in the majority of old species, totally inadequate. Coquillett wrongly places it as a synonym of *C. consobrinus*, Desvoidy. It is quite distinct, most nearly approaching *C. ornatus*, Meigen, the thoracic ornamentation being somewhat similar. In fact, I should not be surprised if it proved to be the American form of that species.

87. *CULEX ORNATUS*. Hoffmanseg. (Meigen.)

*C. equinus*. Meigen.

(Not the *C. ornatus* of Ficalbi.)

(Syst. Besch. Eur. Zweiflügel. i. 5, 4 (1818), Meigen; Klass. d. Zw. i. Aufl. 3, 4, Meigen; Suit. i. 35, 9, Macq.; Dipt. Scand. ix. 3458, 4, Zett.; Fu. Austr. ii. 629, Schiner; Dipt. Neer. p. 327, Van der Wulp.)

Thorax whitish, with two black streaks; abdomen fuscous, with basal white bands; legs blackish, with a white knee spot; proboscis blackish-brown; antennae dark brown, in the ♂ with brown hairs; palpi of the ♂ blackish-brown, with long hairs and three whitish spots; thorax yellowish-white, with two converging

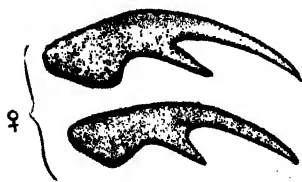


Fig. 186.  
*Culex ornatus*, Meigen.  
Fore ungues of ♀. (Ficalbi.)



Fig. 187.  
*Culex ornatus*, Meigen.  
♂ ungues (after Ficalbi.)

blackish stripes and two others further behind; pleurae blackish-brown, with white spots and marks. Abdomen blackish-brown, with white basal bands. Legs brown, with the coxae dull yellow, femora dark brown, knee spot white, tibiae and tarsi dark brown. Wings with brown scales. Length, 3 lines.



*Observations.*—The type was in the Jardin des Plantes, but has decayed away. I have only seen one poor specimen.

The species much resembles *C. lateralis*, but the basal abdominal bands should at once separate it.

I do not think Ficalbi's description applies to Meigen's *Culex ornatus*. I have been unable to examine this species, so reproduce Ficalbi's figures of the ♂ and ♀ unguis of the species he calls *ornatus*, which apparently has an unadorned thorax.

*Habitat.*—Germany (Meigen); Scandinavia (Zetterstedt); Holland (Van der Wulp); Austria (Schiner); Russia (Gimmerthal); England (Stephens, Verrall, &c.).

#### 88. CULEX CONSOBRINUS. R. Desvoidy.

*C. inornatus.* Williston.

*C. pinguis.* Walker (?).

*C. impatiens.* Walker (?).

(List, Brit. Mus. Dipt. p. 5, Walker (= *impatiens*); North American Fauna, Washington Gov. Press (1893), Williston (= *inornatus*); Science Gossip, pp. 79–81 (1867), Walker (?) (= *pinguis*).)

Thorax bright chestnut-brown, darkened towards the sides, and a narrow dusky central line, with scattered golden curved scales. Abdomen brown, with dusky-brown scales, with basal dull white bands and white scales at the sides.

♀. Head dark brown, depressed in the middle line, covered with creamy curved scales and with ochraceous upright forked ones behind, black bristles, and a few yellowish ones projecting forwards between the eyes; eyes dark, with a dull silvery tinge, and bordered with a narrow line of pale scales; antennae brown, with brown pubescence, basal joint and base of the second joint bright testaceous, with a few pale scales; clypeus brown; face pale testaceous; palpi testaceous, covered with dark brown scales, with a few pale ones on the inside; proboscis very long, brown.

Thorax bright chestnut-brown, darker towards the sides, and with a narrow slightly dusky central line seen in denuded specimens; thorax covered with scattered golden curved scales; scutellum with pale curved scales and dark border-bristles; metanotum bright chestnut-brown with a dark central line; pleurae bright brown with scattered pale scales.

Abdomen (partly denuded) brown, covered with dusky brown

scales, each segment with traces of basal white banding and white scales on the sides.

Legs yellowish-brown; the femora, especially the hind ones, with dusky scales above; knee spots pale.

Wings with the veins yellowish-brown; first sub-marginal cell longer and narrower than the second posterior cell, its base just a little nearer the base of the wing than that of the latter, the cell about twice the length of the stem; stem of the second posterior cell a little longer than that of the first sub-marginal cell, more than half the length of the cell; cross-veins very characteristic, the supernumerary cross-vein is nearer the base of the wing than the mid cross-vein and considerably shorter,

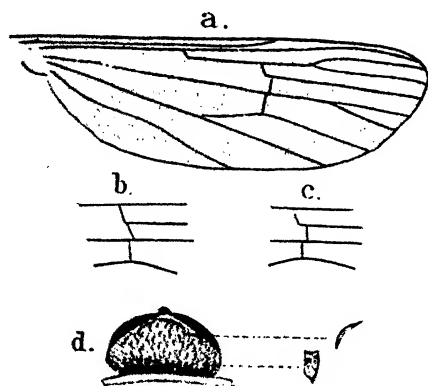


Fig. 188.

*Culex consobrinus*, Rob. Desvoidy.

a, Wing of ♀; b, cross-veins of *C. consobrinus*;  
c, cross-veins of *C. consobrinus* (typical); d, head  
of ♀.

the posterior cross-vein is longer than the mid and close to it, in one specimen almost on a level with it.

Halteres with an ochraceous stem and dark knob.

*Length*.—Of body 6 to 7 mm.; of wings 8 mm.

*Habitat*.—Colorado; Argus Mountains (Will.); St Martin's Falls, Albany River, Hudson Bay (Wlk.).

*Observations*.—This large species is perfectly distinct from *C. pipiens*, L., and I cannot see how Lieut.-Col. Giles in any way made it synonymous. It is a very distinct mosquito, with wings considerably longer than the body, and which have a peculiar distribution of the cross-veins, a character by which it can best be identified; but the position of the posterior cross-vein varies a

little, for in one specimen it is nearly on a level with the mid cross-vein, whilst in the other it is nearly half its own length distant from it.

Neither of the specimens are in good condition in regard to the scales, but I am certain about the abdominal ornamentation. Both specimens were kindly sent by Professor Howard.

*Synonymy*.—*Culex impatiens*, Walker, may be this species, the type answering in nearly all respects, but the abdominal banding differs.

*Culex inornatus*, Williston, I do not know, but Coquillett on good evidence gives it as synonymous with *C. consobrinus*, and the description agrees very well.

*C. pinguis*, Walker, may also be synonymous, but I do not know where the type is, and Walker's descriptions seem almost valueless, judging from the types I have seen.

#### 89. *CULEX NEMOROSUS*. Meigen (1818).

*C. sylvaticus*. Meigen (1818).

*C. guttatus*. Curtis (1829).

*C. prorocans*. Walker (1848).

*C. salinus*. Ficalbi (1896).

(?) *C. reptans*. Meigen (1804).

(?) *C. fasciatus*. Meigen (1804).

(?) *C. stricticus*. Meigen (1838).

(Figs. 97 and 98, Pl. XXV.)

(Syst. Besch. Eur. Zweiflügel. i. 4 (1818), Meigen; Syst. Besch. Sech. Th. (1830) (= *sylvaticus*), Meig.; Guide to Arrang. Brit. Ins. (1829), i. (= *guttatus*), Curtis; Brit. Ent. xii. 537 (1834), Curtis; Ins. Brit. Dipt. iii. p. 217 (1851), Walker; Suit. i. 34, 5, Macquart; Ins. Lapp. 806, 2; Dipt. Scand. ix. 3457, 3, Zetterstedt; Fn. Austr. ii. 628, Schiner; Klass. i. 3, 2 (= *reptans*), Meigen; Klass. i. 4, 5 (= *fasciatus*), Meigen; Dipt. n. d. Fr. 161, 3, Macq.; Dipt. Neer. viii. 327, Van der Wulp; Bull. Soc. Ent. (1896), p. 109 (= *stricticus*, Meig.), reprint (Ficalbi); List. Brit. Mus. p. 7 (= *prorocans*), Walker; Not. sulle Zan. Ital. ix. Nota. (*C. salinus*) (1896), Ficalbi; Venti Spec. Zan. Ital. p. 129 (1899), Ficalbi.)

Thorax black, covered with golden-brown and golden scales, those at the sides being paler and brighter than those in the middle, and may form more or less two distinct parallel narrow lines on each side of the darker central area. Abdomen black,

with basal white or creamy-yellow bands, which are usually expanded laterally and narrowed in the middle, sometimes looking only like white lateral spots; venter white scaled, with three lateral dark spots. Legs black, unbanded; bases of the femora pale yellowish-white. Ungues of the ♀ all equal, thick, uniserrated; of the ♂ with the fore and mid ones unequal, the hind equal, all uniserrated.

♀. Head dark brown, with dense, narrow curved scales all over it of a golden ochraceous hue, and with upright darker ochraceous ones, flat pale ochraceous scales at the sides, with a

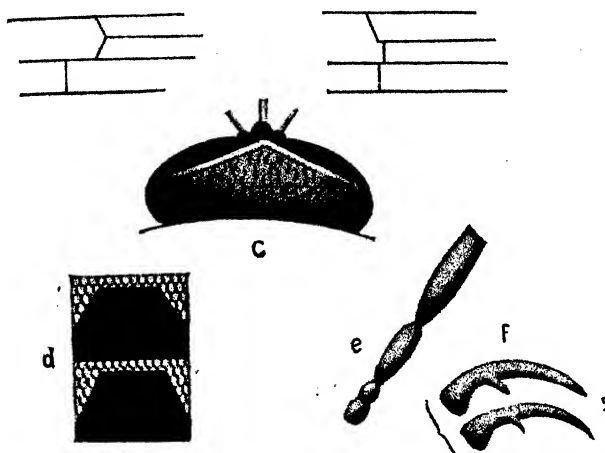


Fig. 189.

*C. nemorosus*, Meigen = *Culex provocans*, Walker.

a, Cross-veins; b, cross-veins of *C. consobrinus*; c, head of ♀; d, abdominal ornamentation; e, ♀ palpus; f, ♀ unguis.

pale border round the eyes; antennae dark brown, basal joint almost black, with white scales, base of the second joint bright ferruginous; palpi, proboscis and clypeus deep shiny black, the former densely scaled; the proboscis markedly curved upwards; the palpi are quite large and have a few very long distinct black bristles; eyes black, with a silvery lustre.

Thorax deep purplish-black, densely clothed with narrow golden and golden-brown scales, those in the middle of the mesonotum thin, deep golden-brown, those at the sides slightly paler and broader, forming a narrow line on each side extending down to the scutellum, the lateral ones on the posterior third of

the mesonotum thin, like the median ones, but paler; in front of the scutellum they are again broader and pale, whilst a dense mass of golden-yellow bristles extends over the roots of the wings; the thick- and thin-scaled lateral areas are marked off by a semi-bare, dark, curved line in some specimens but not in others; scutellum black, with broadish, curved, pale golden scales and numerous pale golden border-bristles; metanotum deep purplish-brown; pleurae dark purplish-brown, with patches of flat pale scales, sometimes densely white scaled. When denuded there are traces of two dark longitudinal lines on the mesonotum.

Abdomen deep black, with narrow white basal bands which widen out laterally, forming large lateral patches; sometimes these bands are distinct, at others they do not show, only the large lateral extensions being seen; on the last segment there are also a few pale apical scales; border-bristles fine and pale; lamellae long, black and hairy; venter whitish scaled, with three more or less distinct dark lateral patches. In some specimens the abdomen has yellowish basal bands, and in others these bands spread out in the middle of the segments, or the flaxen scales may be scattered indiscriminately about.

Legs dark brown; the coxae brown, with creamy-white scales; femora pale yellowish-white at the base and beneath, dark brown above towards the apex, which is white; tibiae dark brown, paler beneath; hind tibiae slightly longer than the metatarsi; tarsi dark brown, almost black; femora, tibiae and metatarsi bristly; ungues all equal, uniserrated and thick.

Wings large, with densely scaled veins; longer than the abdomen, covered along the veins with deep brown scales, the lateral ones long and thin; fringe brown, except at the base, where it has a pallid, almost whitish hue; fork-cells rather short; first sub-marginal cell longer and narrower than the second posterior cell, its stem more than half the length of the cell; stem of the second posterior cell a little longer than the cell; posterior cross-vein about the same length as the mid cross-vein, and about its own length distant from it; border-scales darker than the fringe. The fifth and sixth long veins are particularly densely scaled. Halteres densely clothed with pale yellowish-white to white scales.

*Length.*—7 to 9 mm.

♂. Head and thorax much as in the ♀; antennae dark brown, with brown plumes, basal joint large, deep black, last two joints hairy; proboscis black, long, and thin; palpi dark

brown, rather paler at the base, the last joint swollen, penultimate joint slightly thinner, a little longer, and very hairy; antepenultimate joint with a tuft of hairs and a few short black bristles at the swollen apex; very slightly longer than the proboscis. Abdomen narrow, densely hairy, with white basal bands as in the ♀; last segment with many white scales; genitalia with long thick basal joints, thin long claspers, and a long thin pointed process from the inside of each basal joint. Fore and mid unguis unequal, both uniserrated; hind equal, uniserrated. Wings with the first sub-marginal cell longer and much narrower than the second posterior cell, its stem much longer than the cell, and its base nearer the apex of the wing than that of the second posterior; second posterior cell very short and broad, its stem half as long again as the cell; mid cross-vein longer than the super-numerary, about the same length as the posterior cross-vein, which is distant rather more than its own length from the mid cross-vein.

*Length*.—6 to 8 mm.

*Habitat*.—Europe, from Lapland to Italy; Canada.

*Time of appearance*.—May, June, and August in Europe; June and July in Canada.

*Observations*.—This large mosquito is subject to much variation, and has hence been described under a variety of names. After carefully studying a number of specimens I have come to the conclusion that it also occurs in North America under Walker's name, *C. provocans*. It thus has a wide distribution; this is all the more strange when we know it to be a sylvan species, never entering human habitations.

The unguis of both ♂ and ♀ are marked, and, together with the ♂ genitalia, deep black legs with prominent knee spots, and golden-scaled thorax more or less ornamented, should at once isolate it from other species. *Nemorosus* is a common gnat in England, and so far has never been recorded in houses, out-houses, or privies, where we so frequently find the large *Culex annulatus*.

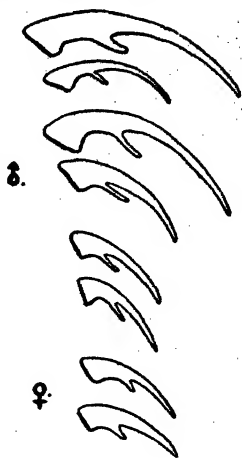


Fig. 190.

Ungues of *Culex nemorosus*.

Fore, mid and hind of the ♂;  
fore only of the ♀.

I have had specimens taken in a great variety of places, such as deep woods, the borders of lakes, along ditches, cuttings, &c. In Canada such localities as the following are given: Trout Creek, nr. Toronto, very abundant in woods; "common on the borders of a marsh"; "from a dry wood"; "common in rich woods and swamps." Ficalbi's variety, *salinus*, occurs in the larval stage in salt water, having been found in the salt marshes of Cagliari, but is also capable of existing, says Ficalbi, in fresh water. Generally speaking, the larvae occur in small ditches, in woods and fields, and even in lakes of considerable size.

This wood gnat varies very considerably both in size and colour. I have seen the ♀'s only 6 mm. long, whilst others are 9 mm.

The thorax generally has a darker broad median line of deeper-coloured scales, but this line may be almost absent or it may be divided into two. In some specimens the borders of the darker median area are very pale, forming two thin, pale golden lines—no doubt the two white lines on the mesonotum mentioned by Walker (Ins. Brit. Dipt.). The deeper median area to the thorax is, however, very characteristic, but, as I gather from Ficalbi's description, as well as from specimens I have examined, there may be no special ornamentation, the difference in colour being very slight. Not only is the thorax subject to variation, but so also is the abdomen; the basal banding may be pale creamy-white or it may be pale yellow in colour; in nearly all cases the bands spread out laterally, forming more or less distinct lateral patches. One specimen I have examined shows these patches as almost white, while the bands are yellow. The basal bands are usually contracted in the middle, in some cases so much so that the abdomen looks unbanded, but with large lateral spots; in a few instances I have seen the basal bands spread out a little in the middle of the segments. The general venation of the wings is similar, but there is some variation in the relative length of some of the veins; the posterior cross-vein may be distant, for instance, its own length from the mid cross-vein, or rather less than its own length. Ficalbi's variety, *salinus*, has the thorax deep umber-brown, and the dorsum of the abdomen speckled with hazel-coloured scales on the posterior three-fourths of the segments, nearly white on the anterior one-fourth; the venter is also pale yellowish, with a black spot on either side of the posterior parts of the third to seventh segments, and also an unpaired spot in the middle, giving the

appearance of triangular white lateral spots. I have seen specimens in England very similar to this.

I make three varieties of this species, as follows:—

variety 1, *salinus*, Ficalbi; posterior three-fourths of the segments speckled with hazel scales, anterior one fourth white.

variety 2, *luteovittata*, mihi; basal bands yellowish, expanded in the middle, lateral spots whitish.

variety 3, *detritus*, Haliday; a small variety with the small scaled lateral basal patches of the mesonotum very prominent.

Probably a number of others could be separated with more material in hand.

*Synonymy*.—Meigen described at least three species which are said to be synonymous with his *C. nemorosus*, namely *C. reptans* and *C. fasciatus* in 1804, and *C. sylvaticus* in 1818. I know nothing of the two former, and give them on the authority of Schiner, Van der Wulp, &c.

Curtis' *C. guttatus* is considered synonymous by both Walker and Schiner. As far as I can see, it is evidently nothing but Meigen's *nemorosus*: the fact that the abdomen is "dorsally

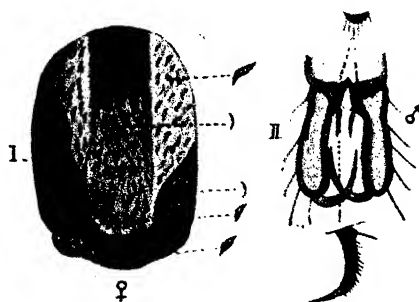


Fig. 191.

*Culex nemorosus*, var. *detritus*.

I. Thorax; II. male genitalia.

ochraceous-brown" can be explained by partial denudation or the presence of flaxen scales, as described by Ficalbi for *salinus*; the twelve triangular lateral white spots probably means six on each side, such as we see in some *C. nemorosus* very plainly. Ficalbi's *Culex salinus* is now shown by him to be only a variety of this species, and therefore needs no further reference.



In many specimens we get the laterally expanded basal white bands broken in the middle, the insect appearing to have basal lateral white spots only. In this form and when the band is very faint they answer very closely to Meigen's *C. stricticus*. Lt.-Col. Giles gives additional notes on *C. stricticus*, after examining the types in the Jardin des Plantes, which also agree closely with the variety *detritus*.

Specimens labelled *C. stricticus* exist in the old collection in the British Museum, but they certainly are not at all related to it. *C. stricticus*, Meigen (1838), may possibly stand as a synonym of *C. nemorosus*, but probably forms a small variety, being only

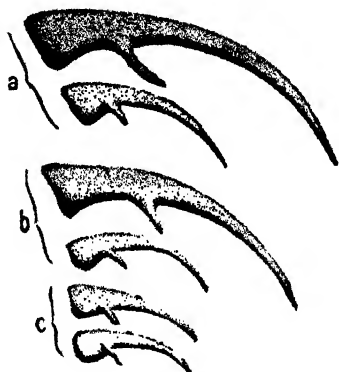


Fig. 192.

*Culex nemorosus*, var. *detritus*, Hal.

♂ unguis.

4 mm. in length. As I have not seen the type, however, and as it is much smaller than any *C. nemorosus* I have yet seen, I append it only a doubtful synonym.

After examining a number of *Culex provocans*, Walker, from Canada, I find it to be the same as Meigen's species treated here. It also bears, like var. *detritus*, a superficial resemblance to *C. pipiens*, but the venation is very different.

In what I have taken to be *C. nemorosus* in Europe and *C. provocans* in America the supernumerary and mid cross-veins make an open angle, but in the closely related *C. consobrinus* they do not meet. Coquillett makes *C. provocans* synonymous with *C. stimulans*, Walker, but it is quite distinct from that banded-legged form.

90. *CULEX SAGAX*. Skuse.

(Proc. Linn. Soc. N. S. Wales, p. 1744 (1893).)

Thorax deep black, with golden-brown and pale, almost white scales, the latter especially before and on the scutellum and at the sides. Abdomen deep blackish to violet-brown, with basal sinuous ochreous bands in the ♀, which spread out laterally on the last two segments in the male. Bases of the legs brown, with a few pale scales; femora pale ochreous at base and below with a few scattered ochreous scales.

♂. Head black, with a patch of grey scales at the sides, pale yellow curved scales above with a few upright forked black and ochraceous ones; eyes black, with silvery reflections, some long black bristles projecting over them; proboscis covered with dark purplish-brown scales; palpi yellowish, covered with dark scales which are especially thick at the ends, so as to give the palpi a black appearance at the extremities; tufts dark brown, towards the basal third is a pale band; antennae banded black and white, plumes black, last joints black.

Thorax deep purplish-black, covered with golden-brown curved scales in front, paler scales behind and at the sides, with three double rows of black bristles, the lateral ones extending down to the scutellum, the median one ending before; scutellum with pale scales and long dark brown bristles laterally, golden-brown bristles in the middle; metanotum deep testaceous; pleurae deep brown, with four or five patches of white scales.

Abdomen deep blackish-brown, the basal parts of the segments with pale ochreous scales; these pale basal bands spread out laterally on the last two segments; venter covered with pale ochreous scales, with black median patches; basal joint of the claspers fuscous, claspers pale; segments bordered posteriorly and laterally with long golden-brown hairs.

Legs with femora and tibiae covered with dark scales above, whitish ventrally, metatarsi and tarsi covered with dark scales, with a metallic dark yellowish reflection in some lights; bases of the femora and tibiae with a few pale scales forming a faint spot at the joints; hind tibiae about one-third longer than the hind metatarsi. Fore and mid ungues unequal, both uniserrated, the larger with a long blunt tooth, the smaller with a short sharp one.

Wings with brown scales, those of the first, second, third,

and fourth, and the upper branch of the fifth, with very long scales. First sub-marginal cell much narrower than the second posterior cell, their stems of about equal length; base of the third long vein rather darkened. Halteres ochraceous.

*Length*.—5 mm.

♀. Head deep brown, with golden-brown scales and hairs; palpi black scaled; proboscis black; antennae black, nearly as long as the proboscis.

Thorax black, with dense golden and whitish scales, with three rows of brown hairs, much as in the ♂.

Abdomen with the segments violet-black scaled, with basal sinuous ochreous bands; venter with ochreous scales; lamellae of ovipositor deep brown, elongate.

Wings with violet-brown scales; the first sub-marginal cell scarcely longer but much narrower than the second posterior cell, its base a little beyond that of the latter; mid cross-vein rather longer than the posterior cross-vein, placed rather less than the length of the latter from it. (Skuse.)

*Length*.—5.08 mm.

*Habitat*.—Murrumbidgee, New South Wales (Skuse); Bupengary, South Queensland (Dr. Bancroft).

*Observations*.—This species was described by Skuse from a ♀ specimen only. Dr. Bancroft sends a ♂ from Queensland which is undoubtedly the ♂ of this species, from which the above description is taken. I may have overlooked the ♀'s in some recent material sent by Dr. Bancroft. Skuse says it is a day-flying mosquito.

Like a good many of the unbanded-legged Australian forms, it is rather obscure, but the golden-brown and pale scaled thorax and the pale scutellar scales will separate it from the other species I have seen.

#### 91. CULEX PERVIGILANS. Bergroth.

(Wiener Entomolog. Zeitung, p. 205 (1889), Bergroth.)

(Fig. 101, Pl. XXVI.)

Thorax dark brown, with dull golden scales more or less longitudinally arranged, with traces of two median parallel bare lines. Abdomen black, with basal white bands; venter white scaled with median black spots. Legs black, with white spots at the apices of the femora and tibiae; unguis of the ♀ small,

much curved, equal and simple; in the ♂ the fore and mid unguis are unequal, uniserrated, the hind equal and simple.

♀. Head covered with creamy-yellow curved scales, flat creamy ones at the sides, with numerous black upright forked ones; eyes deep purplish-black, with a pale border round them, numerous long black bristles projecting forwards; proboscis dark brown, livid beneath in the middle, and sometimes showing slightly livid above; palpi thick, brown, covered with black scales, sometimes a few white ones are scattered about, the last joint large, bristly; antennae black, basal joint deep ferruginous, darker on the inside, base of the second joint dull ferruginous, hairs black, clypeus black.

Thorax deep violet-black, covered with narrow golden curved scales which become paler towards the scutellum, with traces of three median longitudinal parallel lines, the median one with a row of black bristles, the lateral ones bare; scutellum paler than the mesonotum, with narrow pale curved scales and eight median border-bristles; metanotum deep brown at the sides, more or less dull testaceous in the middle, with a dusky median line; pleurae dark and reddish-brown, with a few pale scales; over the roots of the wings are numerous backwardly projecting black bristles.

Abdomen, when denuded, deep black and ferruginous at the bases of the segments, covered with dusky-black scales and basal bands of creamy to pure white scales; first segment with two small median patches of black scales; posterior border-bristles short, pallid; abdomen rather hairy for the ♀; last segment very bristly; ovipositor dark, small.

Legs dark brownish-black, with pale bronzy reflections;

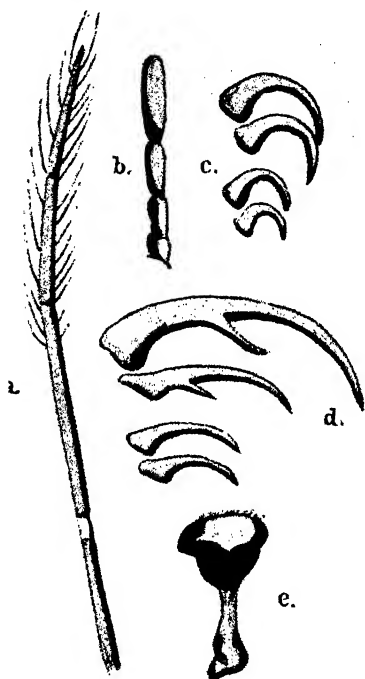


Fig. 193.

*Culex pervigilans*, Bergroth.

, Male palpus; b, female palpus; c, female unguis; d, fore and hind male unguis; e, haltere.

coxae pale brown, darker externally, with a few white scales and black bristles; femora pale underneath, knee spot white, involving both sides of the joint; tibiae with a pale apical spot; femora with longish bristles; tibiae with stouter ones; ungues equal, simple, very small and much curved.

Wings densely clothed along the veins with brown scales, all except the bases of the sub-costal; bases of the first, fifth, and sixth veins with long thin lateral scales; first sub-marginal cell long and narrow, much longer than the second posterior cell, its base a little nearer the base of the wing than that of the latter, its stem short, only about one-fourth of the length of the cell, shorter than the stem of the second posterior cell, which is about one-third the length of the cell; supernumerary and mid cross-veins slightly separate, the posterior cross-vein a little longer than the mid, and about twice its own length distant from it; fringe brown. Halteres with a pale stem and broad cup-shaped knob, with a deep black border on one side.

*Length.*—5.5 to 6 mm.

♂. Antennae greyish-white, with V-shaped black bands, the apex of the V towards the tip of the antenna; the two long apical joints and plume hairs brown; proboscis dark brown, paler in the middle, black at the base; palpi longer than the proboscis by the whole of the last and the apex of the penultimate joint, dark brown, with a narrow pale ring towards the base; last two joints and the upper part of the antepenultimate joint evenly provided with stiff black hairs; apical joint about the same length as the penultimate, pointed.

Abdomen narrow, the basal bands broader than in the ♀, those on the last three segments expanded laterally; densely clothed with golden-brown hairs; genitalia brown; basal joint short and broad; ungues of the fore and mid legs unequal, both uniserrated, hind ungues equal, simple, curved.

*Length.*—6 mm.

*Habitat.*—New Zealand (Prof. R. I. Scott) (21. 7. 1899); and Christchurch, New Zealand (F. W. Hutton).

*Observations.*—A considerable series of this species has been sent from New Zealand, some under the name *C. albirostris*, others as *C. pervigilans*. There were no *C. albirostris* amongst them, all being unbanded-legged forms. The species seems to be common in New Zealand. The female ungues are very marked, being small and much curved.

*Synonymy.*—Giles gives *C. australis*, Erichson, from Tas-

mania, as synonymous, but it cannot be the same, for Erichson states that the ♂ palpi are a little shorter than the proboscis; in *C. pervigilans* they are decidedly longer. Walker's *C. crucians* may be this species, but it is too denuded to make much out of. I think, however, it is distinct, for the two fork cells have their bases nearly level, the halteres testaceous, and the cross-veins slightly different. *C. crucians* was described from Tasmania, and may be synonymous with Erichson's *C. australis*.

92. *CULEX AUSTRALIS*. Erichson (1842).

*Culex crucians*. Walker (1856) (?).

(Archiv. für Naturg. viii. p. 470 (1842), Erichson; Ins. Saundersiana, i. p. 432 (1856) (= *C. crucians*), Walker (?).)

Thorax deep rich chestnut-brown, with small golden curved scales, more or less arranged in lines. Abdomen black, with basal creamy-white bands and large lateral white spots. Legs black, unbanded, with a distinct yellowish knee spot. Ungues of ♀ large, equal, uniserrated. Wings large, with very dark brown scales.

♀. Head dark brown, with numerous long thin golden curved scales in the middle, which are scanty on each side, so that the head appears dark; a distinct narrow pale yellow scaled border to the eyes, flat creamy and then dark scales at the sides; between the eyes project a number of golden-brown bristles; eyes black and silvery; clypeus black; palpi large, testaceous, covered with black scales and a few grey ones and black bristles; antennae brown, basal joint partly testaceous, the inner side with black scales, the second and base of the third testaceous, the second with numerous bristles in the middle; verticillate hairs black; proboscis black.

Thorax deep clear chestnut-brown, with narrow golden curved scales, arranged somewhat in longitudinal rows and with three rows of black bristles, and with numerous black bristles over the roots of the wings; scutellum brown, with narrow pale curved scales, and with numerous golden-brown border-bristles to the mid lobe more or less arranged in two irregular rows; metanotum pale chestnut-brown; pleurae chestnut-brown, with small flat creamy-white scales.

Abdomen covered with dusky black scales, with violet reflections, each segment with a narrow basal band of white scales

and with short pale golden border-bristles, and with large white basal lateral triangular patches; venter mostly white scaled.

Legs unbanded; femora yellowish-white at the base and along the basal two-thirds of the venter; apex and all the upper surface deep brown, knee spot pale yellow, tibiae and tarsi almost black, the former with pale grey reflections below; hind metatarsus not quite so long as the hind tibia; the tarsi show distinct violet reflections; unguis rather thick, equal, uniserrated, deep brown.

Wings testaceous at the base, veins clothed with deep brown scales, the costa being especially dark; longer than the abdomen; first sub-marginal cell longer and narrower than the second posterior cell, their bases nearly level; stem of the first sub-marginal not quite half the length of the cell, about the same length as that of the second posterior cell; posterior cross-vein nearly one and a half times its own length distant from the mid cross-vein.

Halteres with pale stem and fuscous knob.

Length.—6.5 to 7 mm.

Habitat.—Marysville, Victoria (Bancroft) (106).

Time of capture.—October.

Observations.—Described from three ♀'s. It is a large mosquito, very like *C. Frenchii*, mihi, at first sight, but can at once be told by the basally banded abdomen. The long black legs and long dark-scaled wings give it a very marked appearance, and although closely related, is evidently distinct from *C. Frenchii*. The description of Erichson's *Culex australis* applies to this species, which also occurs in Tasmania as well as Victoria. As far as I can judge from notes made on the remnant of Walker's *Culex crucians*, I feel sure it is synonymous, the description having been drawn up from a worn specimen (*vide note re type*). Both original descriptions are appended.

#### Description from Erichson :—

"Testaceus, thorace dorso fusco, abdomine nigro-fasciato, femoribus tibiis que summo apice pallides.

"Antennae luteous. Proboscis somewhat elongate, palpi a little shorter than it is in the ♂. Head fusco-testaceous. Thorax fuscous on the back, testaceous at the pleurae and below. Abdomen covered with a grey pilosity, segments pale at the base, black at the apex. Legs fusco-testaceous, with the femora and tibiae white at the extreme apex. Wings hyaline, veins testaceous, with the anterior ones fusco-villous.

Length of the body,  $3\frac{1}{2}$  lines; of proboscis, 2 lines."

Walker describes the ♀ only, as follows :—

"Fusca; proboscis fulva, apice fusca; antennae nigrae basi fulvae; pectus fulvum; abdomen fasciis albido-testaceis; coxae et femora testacea; alae subcinereae, venis fuscis subciliatus basi testaceis; halteres testacei.

"Brown; proboscis slender, straight, tawny, brown at the tip. Antennae black, shorter than the proboscis, tawny at the base; pectus tawny. Abdomen darker than the thorax, with a whitish testaceous band in front of each segment. Legs brown, coxae and femora testaceous. Wings greyish, veins brown, slightly ciliated, testaceous at the base. Halteres testaceous.

Length of body,  $3\frac{1}{2}$  lines.—Van Dieman's Land."

NOTE.—Walker's type is in the old collection, but in poor condition. The bases of the fork-cells are nearly level, not widely separate as in *C. pervigilans*, both very large, their stems short, and the posterior cross-vein rather more than its own length distant behind the mid cross-vein.

### 93. *CULEX NIGRIPES*. Zetterstedt.

*C. impiger*. Walker.

*C. implacabilis*. Walker.

*C. incidens*. Thomson (?).

(Ins. Lapp. (1838–40), Zetterstedt; Bull. Soc. Ent. Ital. p. 292 (1896), Ficalbi; Brit. Mus. List. p. 7, Walker (= *impiger*); Eugen. Resa. Dipt. p. 443 (= *incidens*), Thomson.)

Thorax black, with ferruginous scales and black bristles in front, and brown ones projecting over the roots of the wings. Abdomen black, with deep fuscous scales and basal white bands, which spread out laterally on the last few segments. Legs black, coxae dark, femora pale beneath; fore and mid ungues of ♀ equal, uniserrated.

♀. Head dark brown, with deep golden-brown curved scales and upright forked ones, and a small patch of pale scales on each side, a tuft of brown bristles projecting forwards; palpi and proboscis black, palpi with paler scales on the last joint, which is broad and flat; antennae black, basal joint with dull ochraceous scales; proboscis long.

Thorax black, with scattered, curved, hair-like, ferruginous to golden-brown scales, paler towards the scutellum, with numerous black bristles projecting forwards and brown ones over the roots of the wings; scutellum black, with pale ferruginous curved scales and deep brown border-bristles; metanotum deep brown; pleurae black, with cinereous and white scales.



Abdomen black, covered with deep fuscous scales, the bases of the segments being clothed with a band of white scales which spread out laterally a little on the posterior segments, and with a fringe of pale golden bristles on their posterior borders; venter black, with scattered pale scales, which form more or less of a line down the centre.

Legs deep brown to black, with pale reflections in some lights, especially beneath the femora, coxae black, hind metatarsus a little shorter than the tibia; fore and mid unguis equal, uniserrated.

Wings with the veins clothed with brown scales, mostly long lateral ones on the major portion of the veins; first sub-marginal cell a little longer and considerably narrower than the second

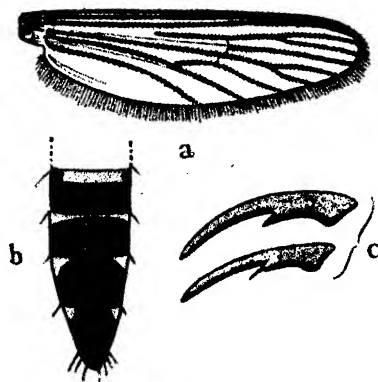


Fig. 194.

*Culex nigripes*, Zett.

a. Wing of ♀ (X. 9.); b, abdomen; c, ♀ unguis.

posterior cell, both fork-cells short, stem of the first sub-marginal not quite as long as the cell, about as long as that of the second posterior cell, which is considerably longer than its fork; posterior cross-vein equal to the mid cross-vein, about its own length distant from it, sometimes rather less; the mid longer than the supernumerary cross-vein. Halteres with pale stem and slightly fuscous knob.

*Length*.—4.5 to 6 mm.

♂. Resembles the ♀, but the abdomen is entirely black, there being no white basal bands; palpi, &c., black.

*Length*.—4.5 to 6 mm.

*Habitat*.—Lapland, Greenland, and the Arctic Circle generally, and Kashmir, India (Dr. Neve) (21. 8. 1899); Virgin's Bay,

Alaska (T. Kincaird); St. Martin's Falls, Albany River, Hudson's Bay (Walker); California (Thomson) (?).

*Time of capture*.—June in Alaska.

*Observations*.—The above description is drawn up from specimens in Mr. Verrall's collection. This mosquito is most troublesome in the northern regions, and occurs in abundance in the Arctic Circle. In Lapland it is a great source of annoyance to travellers, the bite being most poisonous. Dr. Neve, of the Mission Hospital, Kashmir, sends some specimens that are undoubtedly this species. They were taken by him whilst crossing the Deosai Plateau (between Kashmir and Shardo), height 13,000 to 13,500 feet. "I found," he says, "the mosquitoes very troublesome in some places. It occurred to me that it might be of interest to ascertain the variety which can live and breed at such great altitudes, where it freezes at night." (June 26, 1899.) Although the specimens were much damaged, enough remained to show strong resemblances to this Arctic species.

A good series of this very distinct gnat was kindly sent by Professor Howard; they were all taken by Mr. T. Kincaird of the Harriman Expedition to Alaska in 1899.

Lt.-Col. Giles seemed to consider this species (*impiger*) identical with *C. pipiens*; it is, however, clearly distinct, not on account of the white basal banding, but chiefly on account of the wing venation and the toothed unguis. I cannot see any difference between *C. impiger* and *C. implacabilis* of Walker, and consider them synonymous. The only differences I can see at all of importance between the European Arctic *C. nigripes* and the American *C. impiger* in the ♀'s are that in the American form the stem of the first sub-marginal cell is rather shorter than in the European, and the stem of the second posterior cell is about the same length as the cell.

I have not seen any specimens from California, although it seems widely spread in North America. I have some doubt if the species described by Thomson as *C. incidens* is synonymous. Coquillett appears to think so.

Other slight differences detected in the American forms are only those of colour, and cannot be considered specific, namely, the apical segments of the ♀ have sometimes white scales dotted all over them, the palpi are always deep black, and the thorax sometimes shows two broadish darker parallel lines in front and two behind, wider apart, due to the partial absence of scales.

## CULEX NIGRIPES. Zetterstedt.

var. *sylvae*.

Thorax black, with reddish-brown scales in the middle, pale scales at the sides. Abdomen black, with basal white bands. Legs unbanded. Palpi and proboscis black; posterior cross-vein close to the mid cross-vein.

♀. Head dark brown, with narrow curved pale creamy scales and dark upright forked ones, flat creamy scales at the sides; antennae black; basal joint black, with a few grey scales; palpi black scaled, with a few dull grey ones at the tips, last joint broad; proboscis rather long, deep black; clypeus deep black.

Thorax black, clothed with scattered bright reddish-brown narrow curved scales in the middle, pale creamy ones at the sides, and a few in front of the scutellum; over the roots of the wings are tufts of golden-brown bristles; scutellum deep brown, with narrow curved pale scales and golden-brown border-bristles; metanotum black; pleurae dark brown, with a few patches of pale scales.

Abdomen densely black scaled, with clear white basal bands, which are a little contracted in the middle and spread out laterally, forming rather broad lateral patches; posterior borders with clear pale golden bristles; venter white scaled.

Legs unbanded; coxae brown, with white scales; femora and tibiae blackish-brown above; the former densely grey scaled below, the latter also pale beneath to some extent; knee spots white, apices of the femora before the spots deep black; metatarsi and tarsi blackish; unguis of the fore and mid legs equal and toothed, hind ones simple.

Wings with brown-scaled veins, the median ones dark, the lateral long and thin, abruptly truncated and paler, both fork cells rather short; first sub-marginal cell considerably narrower and just a little longer than the second posterior, its stem as long as the cell, its base slightly nearer the apex of the wing than that of the second posterior, whose stem is, if anything, a little longer than the cell and about the same length as the stem of the first sub-marginal; posterior cross-vein quite close to the mid cross-vein. Halteres with the stem ochraceous and the knob fuscous, with grey scales.

Length.—5 mm.

♂. Antennae banded black and dull brown, the plumes bright deep brown; proboscis long, black, labella distinct; palpi deep blackish-brown, the basal joint small, reddish-brown, penultimate joint rather swollen, also the apex of the ante-penultimate, densely plumose, hair-tufts deep brown; palpi not quite as long as the proboscis.

Abdomen long and narrow, with basal white bands, which expand a little laterally, not so deep coloured as in the ♀; genitalia large, dark, and hairy; claspers black, twisted at the end; dense pale pubescence at the sides.

Wings with the fork-cells very small, the first sub-marginal cell much narrower than the second posterior cell, its base nearer the apex of the wing, and its stem about one and a half times its length; stem of the second posterior cell shorter than the stem of the former; posterior cross-vein about its own length distant from the mid cross-vein. Ungues of the fore and mid legs unequal, both apparently uniserrated. I cannot see the tooth in the smaller distinctly.

Length.—6 mm.

Habitat.—New Forest, Hampshire.

Time of capture.—June (June 2, 1899).

Observations.—Described from a ♂ and ♀ sent me by Mr. Bradley. The ♀ approaches most closely the ♀ of Zetterstedt's *C. nigripes*, but differs from all those I have seen in having the posterior cross-vein nearly level with the mid cross-

vein, and not distant from it as in *C. nigripes*; moreover, the thorax is more distinctly ornamented, and the venter of the femora is much whiter than in the Arctic specimens; but, in spite of these differences, I think it can only be considered a variety of the northern form. It will be noticed that the relative positions of the cross-veins differ in the ♂ and ♀. I have not been able to examine a flattened wing of the ♀, so the nearness of the posterior cross-vein to the mid may be only apparent.

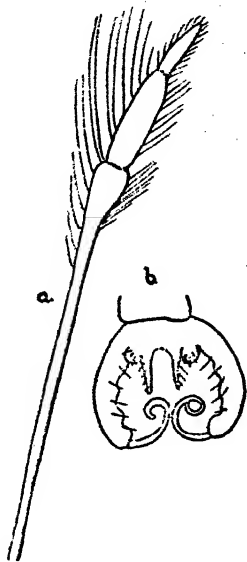


Fig. 195.

*Culex nigripes*, var. *syleae*.  
a, Male palpus; b, genitalia.

94. *CULEX HIRSUTERON*. n. sp.

Thorax brown, with scattered creamy scales (a dark median stripe when denuded). Abdomen deep brown with basal bands of white scales, except on the last two segments, which have a basal patch of white scales on each side. Ungues of ♀ all unserrated, simple.

♀. Head dark brown, densely covered with creamy curved scales in the middle and with scattered upright forked ones, sides of the head with a small patch of almost black flat scales; antennae nearly brown, with pale pubescence, the first two basal joints being clear testaceous, the basal one having a few pale scales upon it on the inner side; palpi covered with brown to almost black scales; proboscis very dark brown, faintly testaceous at the base; clypeus deep testaceous; eyes black, in some with gold and silver reflections.

Thorax brown, with scattered curved creamy scales, when denuded showing a dark stripe in the middle; scutellum paler brown, with a few curved creamy scales and bright brown bristles; metanotum deep chestnut-brown, with more or less purplish reflections; pleurae dark testaceous-brown, with patches of creamy-white scales.

Abdomen covered with deep brown scales, with a purplish reflection under the microscope, with a basal band of white scales to each segment, except the last two, which have a basal patch of white scales on each side; posterior borders with pale hairs, but brown in some lights; on the venter the abdomen is paler brown, with scattered creamy-white scales.

Legs brown, unbanded; coxae chestnut-brown, with a few white scales; femora ochraceous, with scattered dusky-brown



Fig. 196.  
*Culex hirsuteron*. n. sp.  
Fore and mid unguis  
of ♀.



Fig. 197.  
*Culex hirsuteron*. n. sp.  
Wing of ♀. (X. 9.)

scales, but with white scales beneath, the rest of the legs brown; unguis of the fore, mid and hind legs equal, thick, unserrated.

In some specimens the legs are paler brown than in others, and there is a pale knee spot on the hind legs in one of the series.

Wings with long brown scales, testaceous at the root, rather more densely scaled than usual in the genus *Culex*; first sub-marginal cell very little longer and narrower than the second posterior cell, its stem slightly shorter than the fork; the base of the second posterior cell a little nearer the base of the wing than that of the first sub-marginal cell, its stem a little shorter than the cell; posterior cross-vein more than its own length distant from the mid cross-vein, the latter longer than the supernumerary cross-vein. Halteres ochraceous.

*Length*.—3 to 3.5 mm.

*Habitat*.—Woodstock, Virginia, U.S.A. (F. C. Pratt).

*Time of capture*.—June.

*Observations*.—Professor Howard kindly sent four of this species from the United States National Museum. It is a small gnat, quite distinct from any I have seen outside the American Continent, and may at once be told by its compactness, its banded abdomen, and the wing venation and densely scaled wings. They were sent by him under the name *C. pungens*, Wied., but they do not answer at all to the short description of that species, nor do they agree with either Howard's or Coquillett's specimens, for in both Howard's figure of *C. pungens* and Coquillett's table of North American species we find the ♀ has simple, not uniserrated unguis. I can find no species described answering to those sent by Professor Howard.

## 95. CULEX SPENCERII. n. sp.

(Fig. 104, Pl. XXVI.)

Thorax black, with narrow golden curved scales in the middle, the sides with broader, creamy-coloured ones, and two short, parallel, paler lines behind and more pale ones in front of the scutellum. Abdomen covered with creamy and white scales, with large, black-scaled patches on each side of the middle line. Legs brown, pale scales scattered about on the tibiae and metatarsi; femora mostly pale ochraceous, with a few black scales; unguis uniserrated.

♀. Head brown, with pale golden curved scales and yellowish upright forked ones; a pale border round the eyes, small, flat, creamy scales at the sides, and then flat dark ones;

antennae black, basal joint with a large tuft of pale scales on the inside; second joint testaceous at the base; palpi densely black scaled, sometimes grey towards the tip.

Thorax black, covered with narrow, golden-brown scales in the middle, the sides with rather broader, creamy-coloured scales and two short, parallel, paler lines of scales behind, running half across the mesothorax, and similar pale ones in front of the scutellum; dense golden bristles over the roots of the wings; scutellum dark brown, with pale, curved, creamy scales and golden bristles; metanotum deep brown; pleurae dark brown, with dense white scales.

Abdomen covered with black and creamy-white scales, the white predominating, the black scales forming more or less distinct lateral patches, indistinct on the last few apical

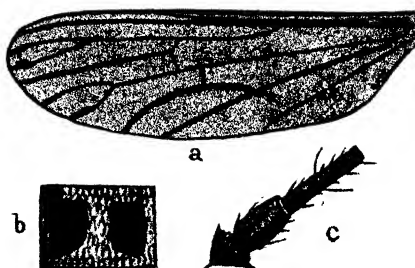


Fig. 198.

*Culex Spencerii*. n. sp.

a, Wing of ♀; b, abdominal segment; c, base of antenna.

segments; the posterior borders with very pale golden scales; venter white scaled.

Legs unbanded; coxae and femora pale ochraceous, almost white, a few black scales above and at the apex; knee spots small, white; tibiae covered with pale brown, ochraceous, and dull white scales, with black bristles, dark towards the apex; metatarsi and tarsi bronzy-brown, a few white scales towards the base of the former; fore and mid ungues black, with a sharp, short, blunt tooth near the base; hind ungues also with small teeth.

Wings with yellowish veins and black and white scales as follows: costa (except at the base), first, second, and fifth long veins dark scaled, also the apices of the fork of the second posterior cell, the others with pale creamy-yellow scales; first

sub-marginal cell very short, a little longer and about half the width of the second posterior cell; its base nearer the apex of the wing than the base of the second posterior cell; its stem equal in length to the cell; stem of the second posterior longer than the cell; posterior cross-vein about its own length distant from the mid cross-vein. Halteres ochraceous with a slightly fuscous knob.

*Length*.—4 mm.

*Habitat*.—Manitoba, Canada (W. I. Spencer) (19. 1. 1900).

*Time of capture*.—July.

*Observations*.—Four specimens of this species have been received. One shows considerable abdominal variation, the white scales being dotted irregularly over the surface; the abdominal ornamentation is, however, decidedly characteristic, as is also the thoracic, and should serve at once to separate it from the other *Culices* with unbanded legs. The distribution of the two coloured scales to the wing is also peculiar. Two of the specimens were from Stony Mountain, and the other two from St. Boniface. It has some resemblance to *C. dorsalis*, but is distinct, having unbanded legs, etc.

#### 96. *CULEX IMPUDICUS*. Ficalbi (1890).

(Bull. Soc. Ent. Ital. 190; Bull. Soc. Ent. Ital. p. 209 (1896); *ibid.* (reprint), p. 166 (1899).)

"A large species with the thorax dark grey-brown dorsally, with two brassy longitudinal stripes behind, paler just over the root of the wings; pleurae grey with white patches of scales; abdomen in the ♀ pure black,

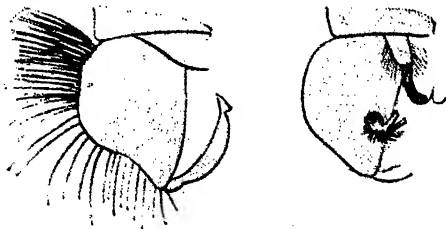


Fig. 190.

Male genitalia of *Culex impudicus* (after Ficalbi)

with narrow basal white bands and a minute posterior white line in the middle of the segments, expanding in five segments into lateral white spots; venter leaden-white, each segment with a lateral black spot at the



base; in the ♂ the black abdomen has a narrow white line in front and behind each segment, those of the contiguous segments combining to form narrow bands; with short stiff brown hairs; male genitalia very marked, the basal joint being very swollen (Fig. 199). Legs dark brown; coxae grey, with white scales, femora leaden-white beneath, remainder

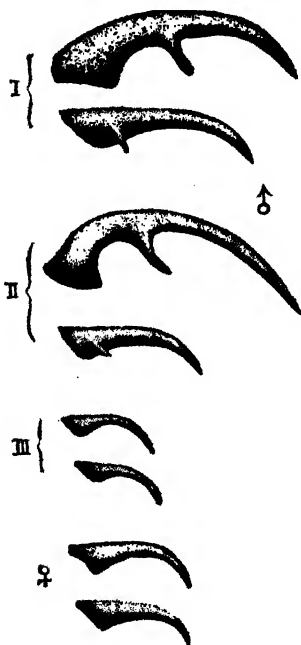


Fig. 200.

*Culex impudicus*, Ficalbi.

♂ and ♀ unguis (after Ficalbi).

dark brown; unguis in the ♀ equal and simple; in the ♂ the fore and mid unguis are unequal, both toothed, the larger one of the fore legs rather thick, the tooth on the smaller claws small and near the base; hind unguis equal, simple, very small; proboscis and palpi in both sexes black; in the male they are pointed and longer than the proboscis by the last and part of the penultimate joint."

*Length*.— $6\frac{1}{2}$  to 7 mm.

*Habitat*.—Sardinia and Sicily.

*Observations*.—This species is described in detail by Ficalbi in "Venti Specie di Zanzare Italiane," p. 166 (1899). A very distinct species, with marked thoracic and abdominal ornamentation and peculiar ♂ genitalia.

97. *CULEX OCHRACEUS*. n. sp.

(Fig. 106, Pl. XXVII.)

Thorax deep blackish-brown, with scattered golden scales at the sides of the mesonotum and two more or less distinct golden-scaled parallel lines. Abdomen densely clothed with pale ochraceous scales, the segments with dark lateral patches in the form of elongated triangles; venter densely ochraceous scaled. Legs ochraceous, with brown scales above in places, the femora pallid beneath; apices of the tibiae, metatarsi, and first tarsal black; knee spot present. Female unguis all equal, black, unserrated. Wings yellowish, with ochraceous and black scales.

♀. Head brown, clothed with narrow curved golden scales on the occiput; laterally with first flat black scales, then flat pale and then deep ochraceous ones, numerous upright forked ones on the occiput, black at the nape, golden-brown in front; eyes deep purplish-black, surrounded with a narrow row of small pale creamy curved scales; clypeus dark brown; palpi bright ochraceous, covered with deep brown scales and a few scattered grey and white ones, very bristly, bristles black; the small mammillated fifth joint is dark in denuded specimens; antennae with the basal joint ferruginous, and also the next five joints, remainder dark brown; proboscis deep ochraceous-black at the apex and with a few dark scales beneath at the base, with numerous small black bristles.

Thorax deep umber-brown to almost black, with hair-like curved bright golden scales, thickest at the sides of the mesonotum and particularly forming two parallel lateral golden lines; scutellum pale brown, with similar golden scales and golden-brown border-bristles; metanotum deep brown to black; pleurae deep brown, with two patches of small fine golden scales above, broader and larger creamy ones below.

Abdomen densely clothed with bright pale ochraceous scales, each segment with lateral black-scaled patches, which expand apically and are pointed basally; venter with dense ochraceous scales.

Legs with the coxae ochraceous, with numerous pale scales; femora pale ochraceous at the base and beneath, covered more or less closely above with brown scales and with long brown bristles; tibiae ochraceous, spotted with brown scales above and with dark bristles; metatarsi ochraceous, deep brown scaled above, dark at

the apex, hind metatarsi much shorter than the hind tibiae; first tarsal joint ochraceous, with a black apex, last three tarsi black, rather ochraceous beneath, those of the hind legs somewhat paler than those of the fore and mid legs; unguis of all three pairs equal, black, thick, and uniserrated. The metatarsi and tarsi are also slightly bristly.

Wings rather yellowish, the veins clothed with dark brown and ochraceous scales, the dark brown scales being especially prominent on the first, third, and fifth longitudinal veins, and on the ends of the fork of the fourth and on the sixth veins, remainder mostly ochraceous; the lateral scales are pale, widely separate, long and truncated; the first sub-marginal cell is longer

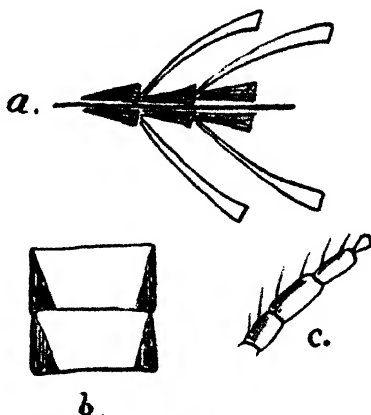


Fig. 201.

*Culex ochraceus*. n. sp.

a, Wing scales; b, abdominal segments;  
c, female palpus.

and considerably narrower than the second posterior cell, its stem equal to about half the length of the cell and about equal to that of the second posterior cell; bases of the two fork-cells nearly level; posterior cross-vein sloping towards the base of the wing, longer than the mid cross-vein, and distant from it about one and three-fourths of its length; costa partly ochraceous; fringe brown, except at the apex, where it has a deep ochraceous tinge in some lights.

Halteres entirely ochraceous.

Length.—4 to 5 mm.

Habitat.—Salisbury, Mashonaland (Marshall) (79).

Date of capture.—March.

*Observations.*—A very distinct ochraceous-bodied species, with markedly characteristic abdominal, wing, and leg ornamentation. It might be mistaken at first sight for a denuded *C. pipiens*, as far as the general appearance goes.

The description is drawn up from a specimen in perfect condition. The species is evidently subject to some variation; the position of the posterior cross-vein varies to no little extent. In old denuded specimens the scales on the thorax look partly silvery and partly golden under the microscope, some evidently fading after a time in the living gnat. The species is common in Mashonaland, a considerable series of females having been sent by Mr. Marshall, but I have been unable to detect a single male.

98. *CULEX TRILINEATUS*. n. sp.

(Fig. 105, Pl. XXVII.)

Thorax bright chestnut-brown, with a median paler scaled line and a still paler creamy line on each side, the space between the three lines forming two broad darker lines. Abdomen densely covered with ochraceous scales above and with dark scaled sides. Legs unbanded, ochraceous basally, dark brown on the tibiae and tarsi, knee spot pale; unguis of ♀ equal and uniserrated on the fore and mid, simple on the hind legs.

♀. Head densely clothed with rather long, golden-yellow, narrow curved scales and ochraceous upright forked ones; clypeus pale bright ferruginous; proboscis deep yellowish on the basal two-thirds, dark brown apically; palpi yellowish, with a few black scales and bristles at the apex, and a ring of them near the base; antennae with the basal joint large, orange in colour, also the greater part of the second joint, remainder dark brown, with black verticillate hairs.

Thorax chestnut-brown, covered with narrow curved golden-brown scales, with three parallel, pale scaled lines, the lateral ones being much paler (almost cream coloured) than the median one; the two intervening spaces seem to be darker than the rest of the thorax and show as two dark broad parallel lines; in front of the scutellum the scales are rather broader and again paler, those at the sides of the mesothorax are also more golden in hue; numerous golden bristles over the roots of the wings, and the lateral lines of bristles end in large patches of golden chaetae in

front of the scutellum ; scutellum ochraceous, with narrow curved pale scales, dense golden-brown border-bristles, which are in two main rows on the middle lobe and very dense on the

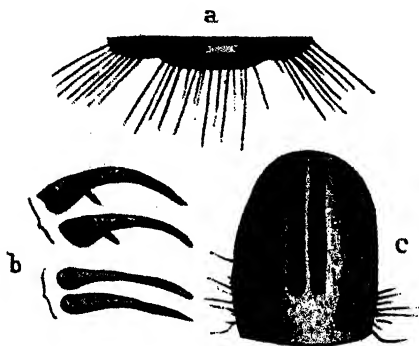


Fig. 202.

*Culex trilineatus*. n. sp.

a, Scutellum ; b, ♀ unguis ; c, thorax.

lateral lobes ; metanotum bright chestnut-brown ; pleurae bright yellowish-brown, with a few pale scales.

Abdomen covered with bright ochraceous scales above, the sides being dark scaled, the lateral dark-scaled areas forming a dark line along each side of the abdomen ; apical segment entirely ochraceous, first segment pale ochraceous, with pallid scales covering nearly the whole surface ; posterior border-bristles very pale yellow ; venter ochraceous.

Legs with the coxae ochraceous ; femora ochraceous except towards the apex, where they are dark brown, extreme apex creamy white, armed along its whole length with long dark thick spines ; tibiae brown, ochraceous beneath ; metatarsi and tarsi deep brown ; both the tibiae and metatarsi are more or less spiny ; fore and mid unguis equal, with a large pointed tooth ; hind unguis equal, thinner and simple, nearly straight.

Wings brown scaled, with a slight yellowish tinge ; fringe brown ; first sub-marginal cell considerably longer and narrower than the second posterior cell, its base a little nearer the apex of the wing than that of the latter ; its stem equal to about two-thirds the length of the cell ; second posterior cell very short, dark scaled, its stem considerably longer than the cell ; posterior cross-vein about its own length distant from the mid cross-vein ;

first, third, and fifth longitudinals darker scaled than the rest of the veins; scales of typical *Culex* form. Halteres entirely ochraceous, the stem pallid.

*Length*.—5 mm.

*Habitat*.—Thayetmyo, Upper Burma (Watson) (94. 4).

*Date of capture*.—August.

*Observations*.—Described from a single female in good preservation. The characteristic thoracic and abdominal ornamentation will at once separate it from any other mosquito. The only one that I have seen to which it approaches is *C. ochraceous*, mihi, but in that species the lateral abdominal dark patches are triangular and the thorax is differently ornamented.

99. *CULEX CONCOLOR*. Robineau Desvoidy.

(Mém. d. l. Soc. d'Hist. Nat. de Paris, iv. 405.)

(Figs. 109 and 110, Pl. XXVIII.)

Thorax brown, with tawny curved scales, with patches of paler scales in the middle line in front, a central patch, two lateral ones and other pale scales in front of the scutellum. Abdomen with brown scales, the first few segments with apical, dull creamy borders; the fifth with a basal dark band, most of it and all the remaining segments densely dull ochraceous yellow; wings with a yellowish tinge.

♀. Head dark brown, purplish in some lights, with scanty creamy curved scales on the crown and around the eyes, black upright ones behind, similar brown ones in front, numerous brown bristles projecting forwards, cream coloured at the sides; eyes purplish, with a cupreous tinge; antennae brown, with pale bands covered with white pubescence and with dark verticillate hairs; basal joint bright ferruginous, also the basal half of the second joint, a few white scales on the first two joints; palpi clothed above with dark purplish brown scales, with a few white ones at the sides and tip, yellowish-brown beneath; proboscis dark at the apex and base, dusky in the middle, apex and base covered with deep brown scales, the middle with ochraceous scales, and scattered dark ones giving it a quasi-banded appearance; there are also scattered black bristles along its entire length.

Thorax brown, covered with tawny curved scales and with patches of deep creamy scales as follows: a patch in the middle line in front, lateral patches in front passing round the edge, a central patch and two lateral ones on the dorsum; there are also numerous creamy scales just in front of the scutellum; thoracic bristles brownish-black; scutellum and metanotum testaceous, the former with scattered curved creamy scales; pleurae pale purplish-brown, with frosty tomentum and one large patch of white scales and other scattered ones.

Abdomen with the front segments covered with dark brown scales, the apical borders being banded with dull creamy scales; the fifth segment with a basal band of dark scales, the remainder all ochraceous yellow, the following segments densely clothed with yellow scales; posterior borders edged with golden hairs; laterally are small basal patches of white scales; ventrally the abdomen is purplish-brown, densely covered with yellow scales. (Lt.-Col. Giles describes the same species as having fawn-coloured scales.)

Legs with the fore femora yellowish, partly covered with brown scales, with a few white ones at the side, creamy at the apex, armed with large black bristles, which are most numerous just at the apex; fore tibiae ochraceous when examined with a hand-lens, but under the microscope seem to be covered with pale yellowish scales, with a few scattered dark ones, and with distinct black bristles; metatarsus black; in the mid legs the femora are much the same, but there are more pale scales towards the apex; the tibiae, metatarsi and tarsi as in the fore legs; in the hind legs they are very similar, but the last tarsal joint seems to have a yellowish tinge and the femora are paler ventrally, especially towards the base.

Wings with faint yellowish tinge along the veins, the veins covered with moderately long brownish scales towards their extremities; first sub-marginal cell longer than the second posterior cell and slightly narrower, their stems about equal and less than half the length of the first fork-cell; anterior and mid cross-veins nearly straight; posterior cross-vein less than its own length behind the mid cross-vein.

Halteres with pale stem and testaceous knob.

*Length*.—6·8 to 8 mm.; proboscis 3 mm.

♂. Head much as in ♀; antennae banded; plumes brown, apical joints with white pubescence; palpi banded blackish and

yellow, with black hairs, especially on the penultimate joint, where they form a dense black tuft; longer than the proboscis by more than their last joint; proboscis dark brown, black towards the base, where it is thickly scaled.

Thorax dark brown, covered with brown scales in front and paler ones behind, with two median dark lines; scutellum testaceous; metanotum pale testaceous; pleurae pale, with a patch of white scales.

Abdomen ochraceous, with scattered dark scales, the fifth, sixth, and seventh segments with apical bands of yellow scales; the apex of the abdomen is entirely covered with yellow scales; the fifth, sixth, and seventh segments have dark brown triangular patches in the middle, the base of the triangles being parallel with their posterior borders; borders of segments and sides of the abdomen with long fine yellowish hairs.

Legs unbanded, like the female; unguis testaceous at the base, dark brown for the remainder, with a distinct black lateral tooth.

Wings with the posterior cross-vein about one-third of its length behind the mid cross-vein; veins with a slightly ochraceous tinge; stems of the two fork-cells about equal in length, that of the first sub-marginal a little shorter than the cell, that of the second posterior about the same length as the cell.

Another specimen has the abdomen with the deep brown scales forming more or less triangular patches and all the segments with pale yellowish-scaled posterior borders, except the last three, which are chiefly yellow scaled, as in the ♀. Ventral surface very pale, yellow scaled towards the apex.

*Length*.—7 mm.; palpi 4 mm.

*Habitat*.—Perak, Straits Settlements (L. Wray) (22. 11. and 21. 12. 1899); Quilon, Travancore, S. India (James); N.W. Provinces (Giles); Fou Chow, China; Madras (Cornwall) (25. 11. 0); Selangor (Butler) (28. 10. 99); Upper Burma (Watson) (94. 4.); Mozafferpur, Behar, Bengal (Green) (88); and Hong Kong (Rees).

*Time of capture*.—August in N.W. Provinces (Giles); August in Burma.



Fig. 203.  
*Culex concolor*, Desv.  
♂ palpus.



*Observations.*—These cannot be confused with any other species. The densely dull yellow-scaled apical segments of the ♀ should make it easily recognisable, together with its large size. Amongst Mr. Wray's specimens are two ♂'s of this species, the abdomen ending in dense yellow-scaled segments like the ♀, and numerous others have been sent. It is only placed provisionally in the genus *Culex*.

The species has also been sent me by Captain James and Lt.-Col. Giles from India, where it appears to be generally common.

Captain James writes me that "the larva of this species is about one-quarter to one-third of an inch long, brownish in colour, and is easily distinguished from other mosquito larvae by the fact that, when resting at the surface of the water, it is completely submerged, and lies almost parallel to the surface, its body being slightly curved. It is carnivorous, and seems to feed chiefly on other larvae." The larva thus approach *Anopheles* in its position in the water.

A specimen labelled *C. fuscus* in the old collection at the British Museum is only this species.

This may be Desvoidy's *Culex concolor*, but the description is so meagre that it is impossible to say definitely without seeing the type, which I cannot trace. I have adopted the name because it seems to be generally known as that species. The habitat, also, from which *C. concolor* was obtained is unknown.

Desvoidy's description is therefore appended :—

"Proboscis, palpi and legs pale yellowish; antennae brown; thorax pale rufous, with three obscure lines; abdomen pale yellow, with the incisures of the segments dorsally brown; legs darker brown. Wings almost limpid, very slightly yellowish, the veins almost nude.

*Length*, 4 lines ♂."

I have not seen the larvae, but they apparently differ from typical *Culex* larvae. The imago also differs in appearance from all the other *Culicidae*. Although I can find no important structural peculiarity in this gnat, I believe it will be shown to belong to a distinct genus, when the larva has been carefully examined.

100. *CULEX TERRITANS*. Walker.

(Ins. Saund. p. 428.)

Thorax brown, clothed with deep golden-brown scales and with two median dark lines; abdomen brown, with whitish hinder borders; legs brown, unbanded; unguis equal and simple.

♀. Head brown, with narrow curved deep golden-brown scales and upright darker forked ones; antennae dark brown, testaceous at the base; palpi brown; proboscis brown, black at the apex.

Thorax brown, with two dark lines, and covered with small, curved hair-like scales of a rich golden-brown tint and with dark brown bristles; scutellum brown, with dark bristles; metanotum brown; pleurae brown, with a few white scales.

Abdomen covered with brown scales, some paler than others, and showing very faint traces of apical bands, scarcely perceptible; posterior border-bristles pale brown to golden brown.

Legs dark brown, bases and venter of the femora pale brown; coxae chestnut-brown, with a few white scales; knee spots creamy-white; unguis equal and simple.

Wings with narrow, long, lateral, brown scales, and with the first sub-marginal cell considerably longer and narrower than the second posterior cell, its stem very short, as in *C. pipiens*, its base much nearer the base of the wing than that of the second posterior cell, and overlapping the junction of the sub-costal and costal; posterior cross-vein more than its own length distant from the mid cross-vein; halteres with pale brown stem and dark brown knob.

*Length*.—6 mm.

*Habitat*.—United States.

*Observations*. — Redescribed from Walker's type in the Museum. The apical abdominal banding is very indistinct in the specimen, and was probably more marked when fresh. I have not seen any fresh specimens. Coquillett states that it is apparently a synonym of *C. pungens*, but the pale, apical, abdominal banding at once separates it from that species.

## 101. CULEX SALISBURIENSIS. n. sp.

Thorax brown, with golden-brown curved scales showing more or less linear ornamentation, a dull, bare, median line and lateral ones at the back, expanding in the middle of the thorax.



Fig. 204.  
Female palpus of  
*Culex salisburyensis*, n. sp.

Abdomen dark brown, with narrow, apical, yellowish bands expanded laterally so as to form yellow lateral spots. Legs brown, unbanded; coxae pale, femora slightly mottled, tibiae and tarsi almost black; knee spot indistinct; unguis of the ♀ equal and simple; fork-cells of the wings rather short.

♀. Head black, with narrow curved pale golden scales and short black upright forked ones, and flat creamy ones at the sides; a distinct pale border round the eyes; antennae brown, basal joint bright testaceous on one side, dark on the other, second joint rather swollen, ferruginous, except at the apex; palpi short, black scaled, the apical joint thick, quadrangular; proboscis black scaled; eyes black, with a silvery lustre.

Thorax dark brown, with narrow curved golden-brown scales, appearing almost yellow in some lights; the denuded surface shows longitudinal ornamentation, with a median bare dark line and a dark bare line on each side behind swelling into a larger bare patch about the middle of the mesonotum; three longitudinal rows of black bristles; scutellum brown, with pale golden narrow curved scales and with seven median border bristles; metanotum deep chestnut-brown, with a dark spot on each side; pleurae brown, with two large transverse lines of creamy scales.

Abdomen deep brown, each segment with a narrow apical border of yellow scales; first abdominal segment dusky, with two small patches of dark scales; posterior border-bristles rather pallid.

Legs dark brown; coxae pale ochraceous, femora ochraceous, with brown scales, which give them a mottled appearance, knee spot very faint; hind metatarsus about as long as the hind tibia; unguis equal and simple.

Wings with brown scales; first sub-marginal cell longer and narrower than the second posterior cell, its base if anything nearer the apex of the wing than that of the latter; its stem

more than one-half the length of the cell; stem of the second posterior cell about two-thirds the length of the cell; mid cross-vein a little nearer the apex of the wing than the super-numerary cross-vein; posterior cross-vein more than twice its own length distant from the mid cross-vein, sloping towards the base of the wing; both fork-cells are rather short; halteres with a pallid stem and fuscous knob, with scattered grey scales.



Fig. 205.

*Culex Salisburiensts*. n. sp. (♀). (X. 9.)

*Length*.—3·8 to 4 mm.

*Time of capture*.—March and April.

*Habitat*.—Salisbury, Mashonaland (Marshall) (79).

*Observations*.—A rather obscure species, but easily identified when examined under the microscope by the narrow, apical, yellow bands to the segments, often only one scale deep, but always present. The legs are quite unbanded and unspotted, but the femora look mottled, owing to the ground colour showing between the scales. The ♀ palpi are of very peculiar form, the last joint being almost quadrangular and thick in form.

## 102. *CULEX MEDIOLINEATUS*. n. sp.

Thorax rich golden-brown, with two paler longitudinal parallel lines wide apart. Abdomen brown, with a broad median ochraceous line, ochraceous lateral basal spots, and traces of apical pale bands; venter ochraceous. Legs brown, with a bronzy-ochraceous tinge, unbanded; femora pale at base. Fore and mid ungues of the ♀ equal, uniserrated, hind equal and simple.

♀. Head covered with narrow hair-like curved golden scales in the middle, and numerous thin ochraceous and deep brown upright forked scales, sides clothed with small flat ochraceous scales, and golden bristles projecting forwards over the coppery eyes; antennae brown, joints rather thick, basal joint testaceous; palpi bronzy-brown; proboscis rich dark ochraceous, with jet-black apex.

Thorax deep rich brown, covered densely with narrow curved golden to bright golden-brown scales, which are slightly paler along two lines, forming more or less distinct parallel paler lines, the scales are also paler in front of the scutellum, numerous thick brown bristles laterally and in three rows on the mesonotum;

scutellum bright chestnut-brown, with narrow pale curved scales and golden-brown border-bristles; metanotum bright chestnut-brown; pleurae chestnut-brown.

Abdomen covered with dusky-brown scales, which are paler along the apical borders of the segments, forming almost apical pale bands; there is also a broad ochraceous line down the middle of the abdomen, basally there is a lateral patch of ochraceous scales on each side of the segments, the first segment is mostly creamy-white scaled, and the second has two large basal creamy-white lateral patches; venter clothed with pale ochraceous scales; laterally and on the posterior borders of the segments are pale golden-brown hairs.

Legs with the femora pale at the base, especially in the hind pair, where the femora are also pale yellowish-brown ventrally nearly to the apex, remainder of the legs brown, darkening to the extremities, which are almost black, but the whole legs show dull ochraceous reflections in certain lights; the femora of the fore and mid legs are rather thick; unguis of the fore and mid legs thick, deep brown, equal and uniserrated, of the hind legs simple and more straight than those of the fore and mid legs.

Wings with the veins clothed with brown scales, the lateral ones of typical *Culex* form; fork-cells short, the first sub-marginal longer and narrower than the second posterior cell, its stem as long as the cell; stem of the second posterior a little longer than the cell; the base of the first sub-marginal cell is nearer the apex of the wing than the junction of the sub-costal and costal veins; posterior cross-vein longer than the mid, about its own length distant from it; fringe dark brown.

Halteres ochraceous.

Length.—4.5 mm.

Habitat.—Thayetmyo, Upper Burma (Watson) (94. 4).

Time of capture.—August.

Observations.—Described from a single ♀ in the British Museum collection. It is a very distinct form, with characteristic abdominal ornamentation. The colours vary considerably in different lights, the legs often appearing dull ochraceous, and again almost bronzy. I do not feel quite sure about the mid unguis, the legs being much entangled beneath the card mount, the fore thick and uniserrated, and the hind equal and simple, and I fancy the mid are like those of the fore legs.

103. *CULEX INFLICTUS*. n. sp.

Thorax brown in front, pallid behind, small pale brown curved scales on anterior part and three double rows of black bristles in front, two behind; pleurae pallid. Abdomen dusky-black, with basal white triangular spots; venter grey. Legs black, unbanded, base and venter of femora grey, knee and tibial spots orange; fork-cells of wings short.

♀. Head brown, with pale curved scales and black upright forked ones, and a border of white curved scales round the eyes; antennae brown, with pale bands, basal joint large and testaceous, dark on the inside; palpi black scaled, testaceous at the base; clypeus chestnut-brown; proboscis dark brown scaled, short, a little longer than the antennae; eyes deep purplish-black.

Thorax with the mesothorax brown in front, pallid behind, the front with small pale brown curved scales, with three double rows of black bristles in front, two rows behind, one on each side of the pale area in front of the scutellum, which has small narrow pale scales and small dark bristles, long black bristles on each side over the roots of the wings; scutellum very pale silvery-grey, with small pale curved scales, seven dark brown bristles to median lobe, and five large ones to the lateral lobes; pleurae pale silvery-grey.

Abdomen covered with dusky-black scales, the segments with basal white triangular spots, and the posterior borders with long pale bristles; venter with grey scales.

Legs covered with deep black scales with purplish reflections, coxae grey, bases and under-sides of the femora white scaled; knee spot and extreme apex of tibiae orange; unguis very small, equal, simple.

Wings with fork-cell short, the first sub-marginal cell longer but no narrower than the second posterior, two and a half times the length of the stem, its base nearer the base of the wing than the base of the second posterior; stem of the second posterior cell a little shorter than the cell; posterior cross-vein nearly four times its own length from mid cross-vein.

Halteres with pale ochraceous stem and fuscous knob.

*Length*.—4 mm. (hind legs 9 mm.).

*Time of capture*.—March.

*Habitat*.—Grenada (W. E. Broadway).

*Observations.*—Very distinct species, easily told by the pallid posterior portion to the thorax, with the strongly contrasted black bristles in two rows, one on each side of the pale space in front of the scutellum, with its small dark bristles and pallid scales. The legs look long and thin.

104. *CULEX RUSTICUS*. Rossi (1790).

*C. punctatus*. Meigen (1818).

*C. quadrimaculatus*. Macquart (1834).

*C. pungens*. Rob. Desvoidy (1827).

(Fn. Etrusca, tom. sec. Libarni. (1790), Rossi; Syst. Besch. Euro. Zweiflüg. i. (1818) (= *punctatus*), Meigen; Bull. Soc. Ent. Ital. (1896) (= *quadrimaculatus*); Revis. Sist. d. fam. del Culicidae Europ. p. 272, Ficalbi (1896).)

"Greyish, the abdomen with black spots. Antennae fuscous, with scanty verticillate hairs; proboscis black. Thorax greyish; all the abdominal segments with black spots. Legs fuscous; posterior very long; femora paler, but the apex black. Wings dusky, with the internal margin ciliated and the veins scaled, &c.

*Length.*— $3\frac{1}{2}$  lines (Rossi)."

Meigen describes *C. punctatus* as follows:—

"Abdomen ashy-grey, with two rows of black spots, triangular in form; thorax brownish-grey, with four dark lines; antennae and palpi of the ♂ dark brown; proboscis brown, &c.

*Length.*—4 lines."

Macquart describes *C. quadrimaculatus* as:—

"Thorax black, with greyish-yellow tomentum, and with the abdomen with quadrangular black spots, &c.

*Length.*— $3\frac{1}{2}$  lines."

NOTE.—There is no doubt that these three are synonymous. *C. rusticus* was described from Tuscany, *C. punctatus* from Solingen in the Hertzberg, *C. quadrimaculatus* from France. There is a specimen named *C. rusticus*, Rossi, in the old British Museum collection, but it is certainly not that species, for the abdomen has basal dull white bands. Verrall records *Culex punctatus* in his list of British species, but on what authority I do not know. I have not met with it in any collection. Stephens also records it from England, and Gimmerthal from Russia. It seems to be a marsh species.—(F. V. T.)

105. *CULEX HORTENSIS*. Ficalbi.

(Bull. Soc. Ent. Ital. p. 292 (1899).)

"Thorax mouse-coloured, tending to yellowish; pleurae bluish-white. Abdomen banded black and white, the white forming narrow bands at the hinder borders of the segments; venter white, with a black spot on either side of the segments. Antennae almost black in both sexes, with a ring of light blue scales on the basal joint; proboscis blue-black, paler at the apex; palpi pointed in the ♂, blue-black, longer than the

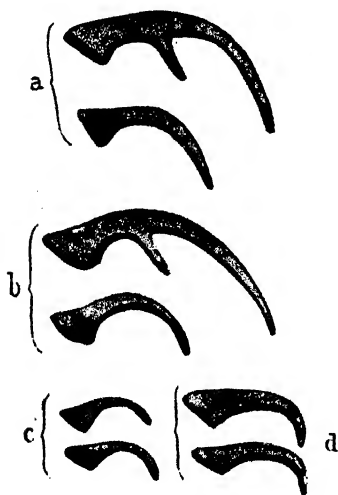


Fig. 206.

a, b, c = male, and d = female unguis of *Culex hortensis* (after Ficalbi).

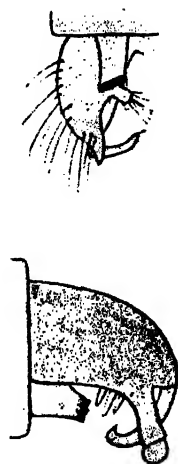


Fig. 207.

Male genitalia of *C. hortensis* (after Ficalbi).

proboscis, similar coloured in the ♀, in both is a median pale band. Legs blue-black, except the bases and venter of the femora, a distinct white knee spot and an apical white ring to the tibiae. Wings blackish, the branches of the fork-cells much longer than the stems; halteres pale.

*Length*.—5 to 6 mm. in ♂; 8 mm. in ♀.

*Habitat*.—Italy."

*Observations*.—Found by Ficalbi in many parts of Italy.

Ficalbi thinks that it lives on the juices of plants entirely, and does not touch animals or man. It seems to be a sylvan species, never occurring in houses.



## LEGS NEITHER BANDED NOR SPOTTED (2ND Division).

*Pipiens Group.*

## A. Abdomen unbanded, with lateral pale patches.

Thorax brown, with small dark brown scales; abdominal segments with basal lateral creamy patches ..... *scholasticus*. n. sp.

Thorax dark brown, yellowish behind, abdomen dark brown, with lateral yellow spots and scanty yellow speckling ..... *modestus*. Ficalbi.

## AA. Abdomen basally banded.

## 1. Thorax unadorned.

Thorax chestnut-brown, golden-brown scales, abdominal bands white, both ungues of ♂ fere and mid legs toothed ..... *virgultus*. n. sp.

Thorax deep brown, golden-brown scales, abdomen with narrow basal bands and lateral patches on the last three segments, smaller fore and mid ungues of ♂ simple ..... *masculus*. n. sp.

Thorax dark brown, golden-brown and bronzy scales; abdominal bands much swollen out in the middle, apical segment white, ungues of ♂ as in *masculus*..... *viridiventer*. Gilos.

Thorax dark brown, golden-brown scales; abdominal bands flaxen, slightly widest in the middle; stem of first sub-marginal cell very short, base of the first sub-marginal cell past junction of sub-costal and costal, fore and mid ungues of ♂ both uniserrated *pipiens*. L.

Base of first sub-marginal cell much nearer apex of wing than junction of sub-costal and costal..... *quasipipiens*. n. sp.

Stem of the first sub-marginal cell about one-third the length of the cell. Otherwise much like *pipiens*..... *Fouchouensis*. n. sp.

Thorax dark brown, thin golden-brown scales, paler behind; abdominal bands pale dusky brown *nigritulus*. Zetterstedt.

aa. Thorax adorned, with lines or spots.

β. Thorax with pale spots.

Thorax chestnut - brown, with golden-brown scales, two round pale spots on the mesonotum, a patch on each side at wing roots and pale scales in front of scutellum; abdominal bands pale yellow, lateral spots white ..... *restuans*. n. sp.

ββ. Thorax with lines.

Thorax deep brown, with narrow golden curved scales; abdominal bands grey, hind metatarsi same length as hind tibiae; venation much as *pipiens*..... *Zombaensis*. n. sp.

Thorax brown, with narrow curved golden scales, and a broad median dark line with deep brown scales ..... *Reesii*. n. sp.

Thorax brown, with narrow curved bronzy scales, lateral dusky lines, and a linear dusky patch on each side in front; legs long and thin *sericens*. n. sp.

Thorax rufous, with two dusky parallel median lines and with minute narrow curved *hair-like* scales ..... *flavipes*. Macquart.

Thorax deep brown, with golden-brown narrow curved scales and two or three long dusky lines; basal abdominal bands curved, white or pale creamy; stem of first fork-cell longer than *pipiens fatigans*. Wiedemann.

Thorax brown, golden - yellow scaled, with four dark bare lines sub-sp. *Skusii*. Giles.

Thorax brown, with golden-yellow scales, with two parallel dark lines in front, broader anteriorly than posteriorly ..... sub-sp. *Macleayi*. Skuse.

Thorax with traces of three dark lines..... sub-sp. *trilineatus*.

Thorax with four golden-scaled lines and lateral borders of golden scales ..... *linealis*. Skuse.

Thorax pale brown, ochraceous in front of the scutellum; abdomen brownish black with white incisions..... *pusillus*. Macquart.

AAA. Abdomen apically pale banded.

Thorax dusky, with grey scales and four dark lines ..... *fuscans*. Wiedemann.

AAAA. Abdomen unbanded, yellow.

Thorax yellowish-brown ..... *pallens*. Coquillett.

Thorax grey ..... *bicolor*. Meigen.

Thorax reddish ..... *lutescens*. Fabricius.

# 106. CULEX SCHOLASTICUS. n. sp.

Thorax chestnut-brown, with small dark brown curved scales and traces of two paler longitudinal lines; abdomen covered with dusky scales, each segment with a lateral dull white basal triangular spot. Legs unbanded, covered with deep purplish-black scales with sometimes bronzy reflections, coxae pallid, femora pale beneath, unguis of the ♀ small, equal, simple; of the ♂ unequal in fore and mid legs, equal and simple in hind; fore and mid uniserrated.

♀. Head with greyish-brown curved scales and black upright forked ones, with a border of pure silky-white ones around the eyes and with a few large black bristles projecting in front, flat white scales at the sides; palpi black, with pale pubescence and a few bristles near the base, paler in some lights; proboscis deep violet-black, apex paler; antennae brown, basal joint bright testaceous on one side, dark brown on the other, base of the second joint also testaceous; clypeus black; eyes purple and silvery.

Thorax brown, with small dark bronzy-brown curved scales and black bristles; when viewed in certain lights with a hand-lens it has a chestnut-brown appearance and two slightly pallid longitudinal lines; when denuded it is bright testaceous, with an indistinct median and two lateral longitudinal lines; scutellum pale silvery-brown, or pale ochraceous, with seven central bristles and eight or nine on each lateral lobe, and with dark scales; metanotum chestnut-brown in some lights, purplish-brown to pale ochreous brown in others; pleurae pale brown to silvery-grey, with a few white scales and a few small black hairs.

Abdomen covered with deep purplish-black scales, each segment having a lateral basal patch of creamy-white scales which are continued on to the sides of the abdomen and form distinct lateral patches, the last segment with a basal creamy-white band and numerous dark bristles, each segment bordered posteriorly with golden bristles, first segment ochraceous-brown, with two small patches of deep purplish-black scales; venter densely white scaled.

Legs with the coxae pallid grey; under surfaces of the femora pale, remainder covered with dark scales, sometimes showing ochraceous brown tinges on the femora, the rest of the legs with dull metallic purple or blue reflections in some lights, brown in others; tibial joint with a pale orange-yellow spot at the apex; unguis small, equal and simple. The tibiae are slightly ciliated at the apex and also at the base of the metatarsi, especially of the hind legs.

Wings with the first sub-marginal cell longer and narrower than the second posterior cell, its stem short, only about one-third the length of the cell, base of the cell nearer the base

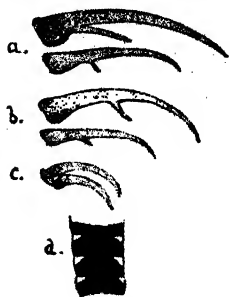


Fig. 208.

*Culex scholasticus*. n. sp.

a, b, c, fore, mid and hind unguis of the ♂; d, abdominal segments.



Fig. 209.

Wing of *Culex scholasticus* (X. 9.)

Fig. 210.

*Culex scholasticus*.

Wing of ♂ (X. 9)

of wing than that of second posterior cell; posterior cross-vein longer than the mid cross-vein, about twice its own length distant from the mid cross-vein; fringe rather deep brown.

Halteres with pale grey stem, fuscous knob.

Length.—4.5 mm. to 5 mm.

♂. Head as in the ♀, but with more silvery scales; antennae banded brown and white, plumes brown, basal joint very bright testaceous; proboscis brown, slightly testaceous at the base; palpi brown, almost black towards the apex, considerably longer than the proboscis, which ends just in front of the base of the penultimate joint of the palpi; no hair-tufts to the palpi, hairs very small.

Abdomen narrow, the lateral patches of pale scales are small, the edges and bases of the segments partly nude and very pale, giving the abdomen a quasi-banded appearance; there are also a few white basal scales on some segments; claspers brown; terminal joints very pale; unguis of the fore and mid legs unequal, both with a single tooth, that on the smaller claw minute and pointed, the tooth being nearly straight, hind unguis both very small, equal and simple.

*Length*.—4·8 to 5 mm.

*Habitat*.—Grenada, West Indies (W. E. Broadway, February 14, 1900, and 63); St. Vincent, Cumberland Bay, and Richmond Estate Works (H. Powell, No. 111, June 10, 1899); St. Lucia (O. Galgey, December 21, 1899).

*Time of capture*.—May (May 16, 1899), St. Vincent; February and March, in Grenada.

*Observations*.—This is a very easily recognised species, by the deep chestnut-brown thorax, dark abdomen, with white lateral patches, and very pale pleurae and bases to the legs.

It is evidently a very abundant West Indian species a large series being sent from St. Lucia, St. Vincent, and Grenada. The Grenada species were taken on the Ballast Ground and in the Botanic Station. The ciliate hind tibio-metatarsal joint also seems characteristic. I cannot satisfactorily identify it with any described species.

#### 107. CULEX MODESTUS. Ficalbi.

(Bull. Soc. Ent. Ital. xxi. 1889; Rev. Sist. d. fam. d. Culicidae Europ. p. 269 (1896); Vent. Sp. Zan. Ital. p. 163 (1899).)

Head with nape dark brown, proboscis and palpi black; antennae with basal joint yellowish speckled with black, remainder black. Thorax dark brown, especially in front, yellowish behind; scutellum dusky-yellow; pleurae yellowish. Abdomen dark brown dorsally with scanty yellowish speckling, yellow spots at the sides; venter yellowish, a small black spot at the base of the last segment; short fine yellow hairs laterally.

Legs with the coxae yellowish with blackish scales; femora black above, yellow beneath, apex white, especially on hind legs; tibiae and tarsi black.

Wings blackish-brown; fork-cells with the branches longer than their stems; stem of the first sub-marginal shorter than that of the second posterior cell.

*Length*.—6 to 7 mm. (including proboscis).

*Habitat*.—Marshes near Ravenna, Italy.

*Time of appearance.*—Summer.

*Observations.*—I have not seen this species. Ficalbi seems to think it may be identical with Zetterstedt's *Culex fuscus*. Lt.-Col. Giles says: "the differences, if any, seem too small to warrant the establishment of the separate species."

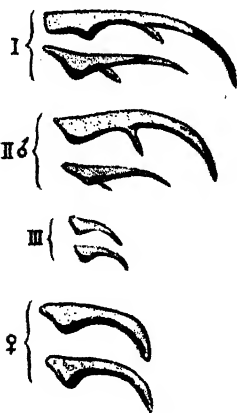


Fig. 211.  
Male and female unguis of  
*Culex modestus* (after Ficalbi).

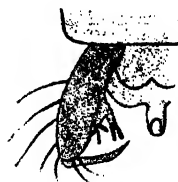


Fig. 212.  
Male genitalia of *Culex*  
*modestus* (after Ficalbi).

According to Ficalbi the female bites very severely at night, and is very noisy in the marshes at Ravenna in summer time. This applies to the species I have taken to be Zetterstedt's *C. fuscus*, found in England at Wicken Fen, but the thorax is bright ferruginous, and not dark brown, as Ficalbi states is the case in his *C. modestus*. The figures here reproduced are from Ficalbi's recent work, which includes the description of the ♂ (Figs. 211 and 212).

#### 108. *CULEX VIRGULTUS*. n. sp.

Thorax bright chestnut-brown, with small curved golden-brown scales and two short single rows of bristles, a pair of bristles before the last one on each side. Abdomen dusky brown, a broad band of white scales at the base of each segment, which on the last few segments form lateral borders. Legs with deep ochraceous-brown scales, darker on the tibiae and tarsi, a yellow spot at the apex of the tibiae. Ungues of the fore and mid legs unequal, uniserrated; of the hind legs equal and simple.

♂. Head brown, with scattered curved creamy scales over the crown, white flat scales at the sides and also white scales forming a narrow border to the eyes, a few black upright forked scales dotted over the crown; eyes purplish-black; palpi much longer than the proboscis, yellowish-brown towards the base, dark brown towards the apex, a small paler yellow band towards the base, hairs dense, silky-brown; proboscis yellowish-brown, darker towards the base and the tip.

Thorax bright chestnut-brown, with numerous small curved golden-brown scales dotted about, two short single rows of bristles running back to the scutellum from about halfway across the mesonotum, the last but one being composed of



Fig. 213.  
*Culex virgultus*. n. sp.  
Male palpus and  
proboscis.

double bristles; the scutellum is pale brown, paler still laterally, covered with pale golden scales; eight long bright brown bristles arising from the central lobe, several from the lateral lobes; metanotum very pale ochraceous-brown; pleurae very pale brown and grey. A tuft of bristles sticks out in front of the sternum, but I am not sure if they are of much specific value, as they cannot always be seen; their appearance is very marked, however, in the two males examined.

Abdomen narrow, covered with deep, dusky purplish-brown scales, a broad band of white scales at the base of each segment, which on the last few segments pass down laterally and along the lateral borders; apical borders of the segments with golden-brown hairs; there is apparently a pale bare shiny band at the base of each segment; both laterally and ventrally the abdomen is clothed with long dense golden hairs.

Legs covered with deep ochraceous-brown scales, paler beneath the femora, and with dark brown scales on the tibiae and tarsi; there is also a deep yellow spot at the apex of the tibiae, particularly plain on the hind legs; hind metatarsi about equal in length to the hind tibiae; unguis of the fore and mid legs unequal, both toothed, hind unguis small, equal, simple.

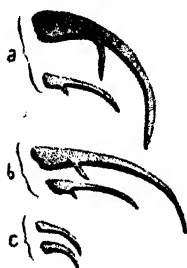


Fig. 214.  
*Culex virgultus*. n. sp.  
♂ unguis.



Fig. 215.  
Wing of ♂ *Culex virgultus*.  
(X. 9.)

Wings iridescent; first sub-marginal cell a little longer and narrower than the second posterior cell, both small; the stem of the former equal to about two-thirds the length of the cell; the stem of the latter nearly equal to the length of the cell; posterior cross-vein equal in length to the mid cross-vein, and situate from it about its own length distant. Halteres with pale brownish-yellow stem and slightly dusky knob.

*Length*.—6 mm.

*Habitat*.—Rio de Janeiro (Senhor Carlos Moreira) (9. 11. 99).

*Time of capture*.—November (November 5, 1899).

*Observations*.—Only two males of what seems a distinct species sent; the disposition of the mesothoracic hairs and the eight scutellar hairs should at once separate it from the allied species. Both specimens sent by Senhor Carlos Moreira from Parque do Musen, Rio de Janeiro.

#### 109. *CULEX MASCULUS*. n. sp.

Thorax deep brown, with golden-brown curved scales, three rows of black bristles, the middle row stopping in the middle of the mesonotum. Abdomen dusky brown, with narrow white basal bands which form three lateral patches on the last three segments. Legs pale at the base and ventral surface of the



femora, remainder purplish-black, a pale spot at the apex of femora and tibiae, last tarsal joint deep ochraceous; six central scutellar bristles. Ungues of the fore and mid legs of the ♂ unequal, the larger one toothed, the smaller simple, also the small hind unguis.

♀. Head covered with creamy scales in the middle, flat white ones at the sides, and numerous black and brown upright forked scales all over the crown; antennae brown, with pale pubescence, dark brown verticils, and testaceous basal joint and base of the second joint; proboscis black, deep ochraceous at the apex; palpi black, short.

Thorax deep brown, covered with golden-brown curved scales and with three rows of black bristles, the middle one stopping at the middle of the mesonotum, the two lateral running back to the scutellum, and also black bristles at the sides; metanotum brown; pleurae with patches of dull white scales.

Abdomen covered with deep dusky-brown scales, the base of each segment with a line of a few white scales, forming on the last three basal segments small lateral patches; on the venter the white basal bands are much more distinct, forming fairly broad bands; the posterior borders of the segments with deep golden-brown hairs; the last segment densely hairy; basal segment fuscous, with long brown hairs from its lateral surface and a small patch of golden ones from the central border.

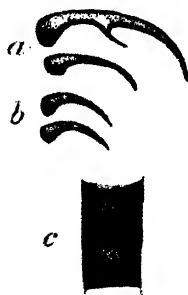


Fig. 216.

*Culex maculur*, n. sp.

a, Fore unguis of the ♂; b, hind unguis of ♂; c, abdominal segments.

Legs with the bases pale grey, and with the ventral surfaces of the femora pale, the rest covered with deep purplish-black scales, except the last tarsal joint of the fore legs, which is of a brownish-ochraceous tinge; knee spots pale, also a white spot at apex of the tibiae; unguis small.

Wings with the veins covered with brown scales, the lateral ones being rather long and blunt; first sub-marginal cell longer and narrower than the second posterior cell. Halteres with the stem pale and the apical half fuscous.

Length.—3·8 to 4 mm.

♂. Head covered with white scales, very distinct and flat at the sides, in the middle a few scattered black upright forked ones; eyes black and silvery; proboscis black; palpi dark brown, with purplish reflections near the end, with a small pale

ring on its basal third, hair-tufts brown; antennae banded brown and grey, plumes silky-brown.

Thorax dull brown, with dull golden-brown curved scales, a bare pale patch in front of the scutellum, with a patch of black bristles on each side and other black bristles laterally; scutellum pale silvery-grey, with six brown bristles from the border of the central lobe and three large and three small from each lateral lobe, central lobe with a few pallid golden scales; metanotum pale brown; pleurae pale brown, with cinereous tomentum, and with a row of small distinct black bristles pointing backwards.

Abdomen covered with deep purplish-black scales and with white basal bands, which broaden out laterally, especially on the last few segments, dark scaled ventrally, the whole with dense lateral and ventral golden-brown hairs.

Fore legs brown, a yellow spot at the end of the tibiae, the last tarsal joint deep ochraceous; mid legs brown, femora pale below; hind legs the same, but with a yellow knee spot; fore and mid unguis unequal, the larger one with a large tooth curved to the point, the smaller one un-toothed, hind ones small and equal.

Wings with the veins clothed with brown scales, with moderately long lateral ones; first sub-marginal cell a little longer and narrower than the second posterior cell; their bases and stems nearly equal; stem of the former equal to more than half the length of the cell; posterior cross-vein more than twice its length distant from the mid cross-vein. Halteres with pale stem and fuscous knob.

*Length*, of body, 4.5 to 4.8 mm.; of palpi, 2.5 to 3 mm.

*Habitat*.—Freetown, Sierra Leone (Austen, September, 1899; 99. 267).

*Time of capture*.—September.

*Observations*.—Three ♂'s and one ♀ brought back by Mr. Austen and bred by him from larvae from a roadside puddle at Wilberforce, Freetown. They might at first sight be mistaken for the ♂'s of *Culex dissimilis*, but differ in many respects; there is no pale proboscis band, the small unguis of the fore and mid legs are simple, and the tooth of the large one is curved to the point of the unguis; the basal banding of the abdomen is white and expanded laterally, and there are more lateral bristles to the scutellum. A single ♀ in the collection brought back by Mr. Austen is undoubtedly of this species.

Fig. 217.

*Culex masculus*, n. sp.  
Wing of ♂. (X. 9.)

110. *CULEX VIRIDIVENTER*. Giles.

(Journ. Bombay Nat. Hist. Soc. p. 609, no. 4, vol. xiii. (1901).)

(Fig. 116, Pl. XXIX.)

Thorax dark brown, with short and narrow curved deep golden-brown to bronzy scales, paler in front of the scutellum. Abdomen dusky-black, with basal white bands on the second and third segments, not always complete; on the fourth to sixth the bands are very distinct, and swell out in the middle; apical segment white. Legs black; coxae and bases of the femora greyish-white; knee spots very clear behind; unguis of the ♀ equal and simple; of the ♂ unequal in the fore and mid legs, the larger one uniserrated; hind unguis equal, simple, very small.

♀. Head brown, with narrow, pale, curved scales over the crown and numerous black upright forked ones, a narrow border of pale curved scales round the eyes and flat dull white scales on each side; eyes deep purplish-black; antennae dark brown, with pale pubescence and black hairs; basal joint and base of the second joint bright testaceous; palpi short, black scaled; proboscis black.

Thorax dark brown, with short narrow curved deep golden-brown to bronzy scales and a few black bristles over the roots of the wings, with a single row of bristles on each side of the notum of the mesothorax, and others round the bare space in front of the scutellum, where the scales are paler; scutellum paler than the mesonotum, brown, with a grey sheen in certain lights, yellowish at the sides, scales narrow curved and pale, almost grey; mid lobe with six dark brown bristles; metanotum chestnut-brown; pleurae brown, with a few pale hairs.

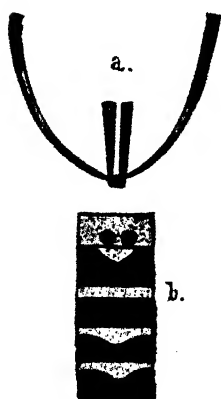


Fig. 218.

a, Wing scales, and b,  
abdomen of *Culex viri-*  
*diventer*, Giles (♀).

Abdomen steely-black, covered with dusky-black scales and with basal white bands, not always complete, on the second and third segments; on the fourth to sixth, inclusive, the basal bands are distinct and swell out in the middle; apical segment white; first segment steely and ochraceous, with two patches of dark brown scales; posterior borders of the segments with short

golden hairs, the apical segment with dense golden-brown hairs; venter entirely yellowish-white, greatly contrasted with the dorsum.

Legs black; coxae, bases and venter of the femora greyish-white, a distinct knee spot to the hind legs and an indistinct one to the fore and mid legs; hind metatarsi about the same length as the hind tibiae; apex of the hind tibiae and bases of the metatarsi with rather dense golden hair-like scales; the femora and tibiae are ochraceous in ground colour, the dark appearance being due entirely to dark scales; the metatarsi and tarsi are quite black, but in certain lights the whole legs have a bronzy tinge; unguis equal and simple.

Wings with the veins very clearly defined and sparsely clothed with scales, the middle scales being rather long and thin and close together, the lateral ones curved, almost like hairs; first sub-marginal cell a little longer and slightly narrower than the second posterior cell, its base nearly level with the junction of the sub-costal and costal, considerably longer than its stem, but varying from three and a half to under three times the length of the stem, its base either a little nearer to or a little further from the base of the wing than that of the second posterior cell; second posterior cell two and a half to three times as long as its stem, which may be either a little shorter or longer than the stem of the first sub-marginal; posterior cross-vein longer than the mid cross-vein, distant from it either its own length or just under or over its own length, sometimes as much as one and a half times its own length distant.

Halteres with pale ochraceous stem and slightly fuscous knob.

*Length*.—5.5 to 6 mm.

♂. Head with pale curved scales in the middle, with dull white flat ones at the sides, which become dirty ochraceous as they pass on to the crown, with broad and narrow upright forked scales, dark brown and dark ochraceous in colour, a white border round the eyes; palpi black, with a narrow indistinct pale band at the base of the last three joints, pointed, hair-tufts short scanty and dark brown; the penultimate joint about one-third shorter than the apical joint, the antepenultimate joint longer than the two preceding together; proboscis black, shorter than the palpi; antennae with basal joint bright deep testaceous, banded grey and black, verticillate hairs, deep brown, flaxen at the base, last two joints with pale pubescence.

Thorax as in the ♀. Abdomen broadening out posteriorly; segments black, with basal white bands, which on the second to fifth segments spread out in the middle, and the same to some extent on the sixth segment; apical segment dull white scaled; male genitalia and last segment densely golden-haired. Wings with the fork-cells rather long; the first sub-marginal cell a

little longer than the second posterior cell, its base nearer the apex of the wing than the base of the latter, both cells about twice as long as their stems; stem of the first sub-marginal cell about equal to that of the second posterior cell, a little the shorter if anything. Ungues of the fore legs unequal, the larger one uniserrated; the hind equal and simple, very small.

Length.—4 to 5 mm.

Habitat.—Naini Tal, India (Giles).

Time of capture.—June and July.

Observations.—Lt.-Col. Giles sends in his

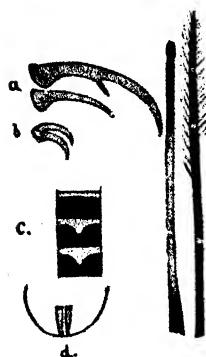


Fig. 219.

*Culex viridiventer*, Giles (♂).

- a, Fore unguis of male;  
b, fore unguis of female;  
c, abdominal segments;  
d, wing scales;  
e, male palpus and proboscis.

collection a large series of a new species, for which he proposes the name *viridiventer*. These mosquitoes are evidently common at Naini Tal at an elevation of 7,000 feet. They present several peculiari-

ties, notably the wing scales, which are very small, the lateral ones being extremely thin and hair-like; the banding of the abdomen in the ♀ is also very characteristic, and the clear pale venter strongly contrasted against the dark tergum. The venation is subject to considerable variation, nearly as much so as in *C. fatigans*. In some specimens the base of one cell, in others the base of the other, is nearer to the apex of the wing; the relative length of the stems and the position of the posterior cross-vein also vary.

Specimens of this species have been presented to the collection by Lt.-Col. Giles.

Regarding this species, Lt.-Col. Giles sends me the following note: "It differs radically from *Culex fatigans* in habits of life, for both this and *C. pulcriventer* are purely phytophagous, sylvan species; though I liberated a number in my sleeping-room, none ever attacked me, and they seemed to die for want of vegetable food. Moreover, except by accident, they never seem to enter houses. In the fresh insect, however, there is no difficulty in

distinguishing the species from each other (i.e. *C. fatigans* and *C. viridiventer*) at a glance by the form of the light abdominal bands, which are distinctly triangular in well-marked specimens of *C. viridiventer*."

The specimens kindly sent me were bred from pools in the course of the surface-drainage system. Regarding these pools, Lt.-Col. Giles says: "Even in moderate rain these pools are mere

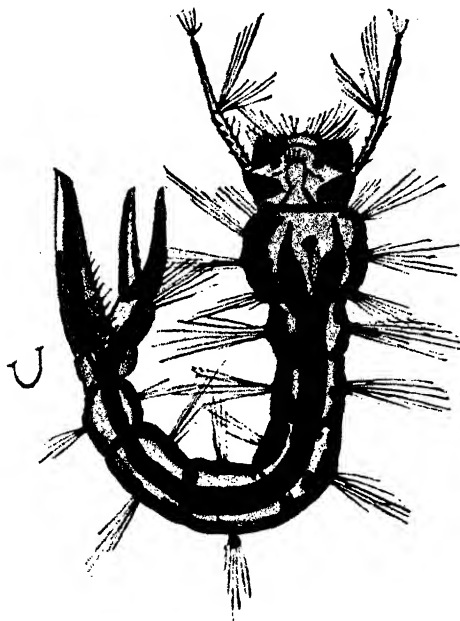


Fig. 220.

Larva of *Culex viridiventer*, Giles.

interruptions in the course of a roaring torrent, and it is difficult to understand how any *Culex* larva can maintain itself in such a position; nevertheless, there it may be found, even immediately after the heaviest rain."

The figure of the larva is from a rough sketch by Lt.-Col. Giles. The point of interest is the great length of the antennae, and, like *C. fatigans*, the considerably elongated respiratory tube.

## 111. CULEX PIPIENS. Linnaeus (1758).

*C. vulgaris*. Linnaeus (1767).*C. alpinus*. Linnaeus (1767).*C. agilis*. Bigot.*C. ciliaris*. Linnaeus (1767).*C. communis*. De Geer.*C. rufus*. Meigen (1818).*C. phytophagus*. Ficalbi (1889).(?) *C. domesticus*. Germar (1817).

(Fn. Suec. (1890), Linn.; Sp. Ins. ii. 469, 1; et Ent. Syst. vi. 400, 1; et Syst. Antl. 33, 1, Fabr.; Ins. Austr. 481, 980; et Fn. Boica. iii. 2585, Schrank; Klass. i. 5, 9; et Syst. Besch. i. 7, 10, Meigen; Gen. Crust. iv. 246, Latr.; Dipt. n. d. Fr. 161, 4; et Suit. i. 34, 4, Macq.; Ins. Lapp. 807, 4; et Dipt. Scand. ix. 3455, Zett.; Fn. Austr. ii. 628, Schiner; Dipt. Neer. 328, V. d. Wulp; Venti Sp. Zan. Ital. 159, Ficalbi; Syst. Nat. xii. 1002, 2, Linn. (= *ciliaris*); Ins. Austr. 481, 981, Schrank; Ins. Lapp. 807, 5; Dipt. Scand. ix. 3456, 2, Zett. (= *ciliaris*); Fn. Austr. ii. 628, 1, Schiner (= *ciliaris*); Dipt. Neer. 329, V. d. Wulp (= *ciliaris*); Ins. Brit. Dipt. iii. 247, Walker (= *ciliaris*); Ins. vi. 316, 1, De Geer (= *communis*); Bull. Soc. Ent. Fr. ix. 122, Bigot (= *agilis*); Syst. Besch. i. 7, Meigen (= *rufus*); Rev. Sist. d. Culicidae Europae, p. 276, Ficalbi (= *phytophagus*); Reise nach Dalmation, &c., Germar (1817); Syst. Besch. i. 8 Meigen (= *domesticus*).)

(Fig. 113, Pl. XXIX.)

Thorax dark brown, with golden-brown curved scales and three rows of black bristles. Abdomen covered with dusky-brown scales and with basal flaxen bands, broadest in the middle, and which broaden out laterally to form spots; venter pale yellow scaled. Legs unbanded, brown, with an ochraceous lustre; coxae yellowish-brown, femora pale beneath, knee spot white, tarsi dark brown. First sub-marginal cell very long and narrow, its stem very short. Ungues of the ♀ equal, simple; the ♂ fore and mid unguis unequal, both toothed, the hind equal, simple.

♀. Head clothed with curved golden-brown scales in front and in the middle, and with numerous dark brown forked upright ones, the sides of the head covered with creamy-white flat scales; antennae dark brown, with pale pubescence and dark verticils, basal joint and base of the second joint dark testaceous; palpi thick, brown, with some greyish scales; proboscis ochraceous-brown in the middle, black towards the apex and towards the base, extreme tip ochraceous, ventral surface

ochraceous, except the apex, which is black; eyes deep purplish-black, with a few silvery markings.

Thorax dark brown, covered with golden-brown curved scales, with three lines of black bristles, the median one ending in front of a bare space before the scutellum, the lateral ones reaching the scutellum; in some specimens dark thoracic stripes show through the scales in front; scutellum with pale golden curved scales and golden-brown bristles; pleurae chestnut-brown, with a few small patches of pale creamy scales; metanotum pale chestnut-brown.

Abdomen covered with dusky-black scales, the bases of the segments with a band of flaxen-yellow scales; the bands are

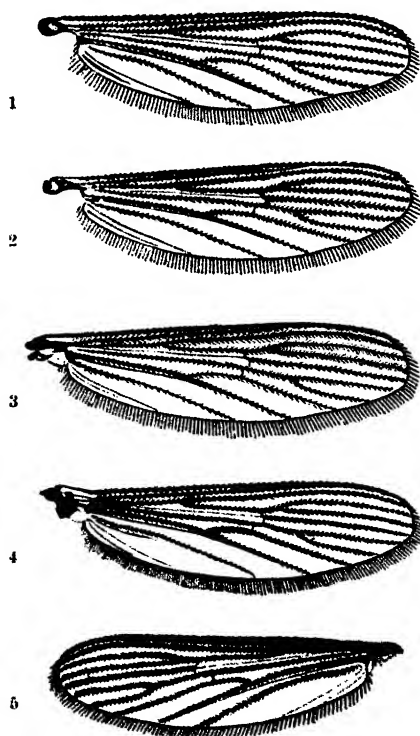


Fig. 221.

*Culex pipiens* (♀).

(Showing slight variations of cross-veins.)  
(X. 9.)

broadest in the middle on the front segments, and broaden out laterally, and there is a pale patch of scales on each side at the



base; each segment has also a rim of golden-brown hairs on the posterior border; venter covered with yellowish scales.

Legs with the coxae yellowish-brown, femora pale beneath, brown scaled above, with a very deep apical ring and a small white ring at the extreme apex; tibiae brown, with an ochraceous lustre and an apical band of yellow; tarsi uniformly dark brown. The legs appear quite pale in some lights; unguis equal and simple.

Wings with the veins covered with long brown scales, except the fifth and its lower branch; the first sub-marginal cell very long and narrow, much longer than the second posterior cell, its stem extremely short, the fork at least seven times as long as the stem; base of the cell much nearer the base of the wing than that of the second posterior cell; the stem of the latter equal to about half the length of the cell; posterior cross-vein about equal in length to the mid cross-vein, and distant from it about its own length; fringe brown, with pale reflections. Halteres pale ochraceous, slightly darker brown at the apex.

Length of ♀, 4.5 to 6 mm.

♂. Palpi much longer than the proboscis, light ochraceous brown, with dark hairs; proboscis deep ochraceous, dark towards the tip; antennae banded, with bright chestnut-brown plumes.

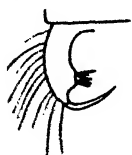


Fig. 222.

*C. pipiens*, L.  
Male genitalia.

Abdomen narrow, the segments with broad basal bands of flaxen scales, the last few bands expanded laterally, hairy; male claspers brown.

Fore and mid claws unequal, the smaller with a small sharp tooth at the base, the larger with a large blunt tooth; hind unguis equal, simple.

The wings are not so thickly scaled as in the ♀; the first sub-marginal cell is longer and narrower than the second posterior cell, its stem about one-fourth the length of the cell, the base of the cell is nearer the base of the wing than that of the second posterior cell; the stem of the latter nearly as long as the cell itself; posterior cross-vein quite twice its own length distant from the mid cross-vein.

Length.—4.5 to 5 mm.

*Habitat.*—Europe generally, from Scandinavia to Italy; Malta (Birt); N. America (Hessler).

*Time of appearance.*—In Europe in March to July onwards, practically throughout the whole year. I have taken specimens in every winter month in warm winters.

*Observations*.—The type taken as that of *Culex pipiens*, L., has many closely related species. That variable species, which I have taken to be *C. fatigans* of Wiedemann, is very closely related to our common European gnat, but I am sure they are quite distinct. In all the *Culex pipiens* I have examined, both from Europe, Malta, and North America, the stem of the first sub-marginal cell is abnormally short for the very long cell, and the abdominal banding is of a constant flaxen-yellow colour. The character of the first sub-marginal cell and its stem is one by which the species is best identified.

*Culex pipiens* is subject to great variation in size and also in regard to certain features of its venation.

I have known it to vary from 4 to 6 mm. in the ♀ sex. This difference in size can be produced artificially by excess or absence of food. Two batches of larvae from the same egg-raft were kept, one in distilled water, fed only now and then, the other with a plentiful and constant supply of food, the difference in length being in some specimens 2 mm.

The venation varies in regard to the relative position of the posterior cross-vein. Usually in the ♀ it is about its own length distant from the mid cross-vein, but in some specimens it is not half its length distant, in others nearly twice its length away.

In one specimen photographed for me by Mr. Hammond the venation differed in this respect in the two wings (Fig. 221, 3 and 4), but beyond this the nervures of *Culex pipiens* are very constant and very characteristic.

The ♀'s hibernate in cellars and outhouses, and appear mostly in March and April, but do not, as far as my observations go, deposit their eggs for some little time. No males are to be found in the early part of the year, the females having been fertilised by the males in the previous autumn. I have known this gnat active in numbers well into November in England, and they occur during the winter in houses. The larvae are found in rain barrels, cisterns, and small pools, or any receptacle where water will collect. The first lot of larvae seem to mature in June, and from then they go on appearing until October. One may find larvae of all sizes in the same vessel. This species is known to bite some years with considerable severity.

*Synonymy*.—I have examined Bigot's type of *C. agilis* from Algeria, now in Mr. Verrall's possession, and find it is only *Culex pipiens*.

All the specimens I have seen labelled *Culex ciliaris* have proved to be only *C. pipiens*. It was undoubtedly described from a small *Culex pipiens*; the "ferruginous thorax" I have often noticed in true *pipiens*, and that is the only difference of importance one can detect in the description. The yellowish-ferruginous abdomen mentioned by Schiner can easily be produced in the common house gnat by denuding its surface.

Ficalbi recently states that his *C. phytophagus*, described in 1889, is only this common species. Certainly there is nothing to separate Meigen's *C. rufus* from it, nor Linnaeus's *C. alpinus* and *C. vulgaris*.

Germar's *C. domesticus* may possibly be the same; certainly Stephens's record for England refers to it. Ficalbi only says he has seen Rondani's old specimen obtained in Italy. By the hinder parts of the segments I understand the basal part, and thus there is nothing of vital importance to differ in the description from *C. pipiens*.

I have also seen denuded specimens of this species named in cabinets *C. lutescens*.

#### 112. CULEX QUASIPIPIENS. n. sp.

Thorax brown, with narrow curved golden scales. Abdomen brown, with curved very pale yellow to white basal bands, last segment often pale scaled. Legs unbanded, brown; knee spot pale; unguis equal and simple. Wings much as in *C. pipiens*, but the stem of the first sub-marginal a little longer, and the posterior cross-vein considerably further off, and the relative positions of the sub-costal, costal, and base of the first fork-cell different. Head with pale scales. Thoracic scales broader than in *C. pipiens*.

♀. Head deep brown, with very narrow grey curved scales on the occiput, and black upright forked scales, which form a black patch on each side near the neck, a narrow band of pale scales bordering the eyes, and a row of six bristles on each side projecting inwards and over the eyes; clypeus bright brown; palpi like *C. pipiens*, covered with black scales and black bristles; proboscis deep brown; antennae deep brown, basal joint chestnut-brown, base of the second joint testaceous.

Thorax deep brown, with narrow pale golden curved scales, which become paler in front of the scutellum; scutellum ochraceous-brown, with narrow curved scales and golden-brown border bristles; metanotum chestnut-brown; pleurae pale ochraceous.

Abdomen ochraceous, with deep brown scales and basal pale creamy bands curved from side to side; with thin rather long border-bristles and numerous long lateral brown hairs; venter pale ochraceous.

Legs unbanded, brown; coxae and venter of femora pallid; a pale indistinct spot at the apex of the femora and tibiae, especially noticeable on the apex of the hind tibiae; hind metatarsus a little longer than the hind tibia; unguis equal and simple.

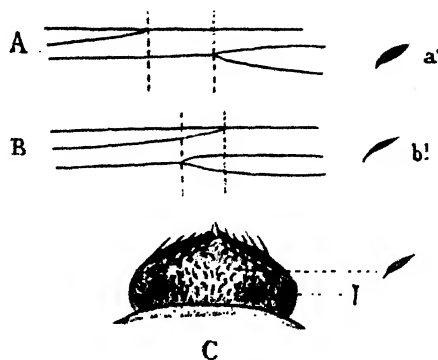


Fig. 223.

A, Junction of sub-costal and costal of *Culex quasipipiens*, n. sp.; a', enlarged thoracic scale.

B, Junction of sub-costal and costal and base of first fork cell of *Culex pipiens*, L.; b', enlarged thoracic scale.

C, Head of *C. quasipipiens*.

Wings with venation differing from *Culex pipiens*, in that the base of the first sub-marginal cell is much nearer the apex of the wing than the junction of the sub-costal and costal (Fig. 223, A and B).

Length.—5 mm.

Habitat.—Sambalpur, Central Provinces, India (Murphy)(99).

Observations.—Very like *C. pipiens*, but differs in wing venation and in the form of the head scales, which are smaller in this species and in the larger thoracic scales.

### 113. CULEX FOUCHOWENSIS. n. sp.

Thorax dark brown, with narrow curved dull golden scales. Abdomen deep brown, almost black, with basal dull white bands. Legs unbanded, dark brown; hind metatarsus much longer than the hind tibia. Wings with brown scales, the lateral ones

linear and very dense, venation as in *fatigans*. Border-bristles of abdominal segments alternately long and short. Ungues of the female equal and simple.

♀. Head dark brown, with narrow golden curved scales in the middle, becoming paler at the sides, which are covered with flat white scales, a narrow white-scaled border surrounds the eyes, on each side of the occiput is a patch of black upright forked bristles and some ochraceous ones between; clypeus, palpi, antennae and proboscis deep brown, the antennae with deep brown basal joint and pale pubescence; palpi short.

Thorax deep brown, covered with short, scattered, very narrow curved golden-brown scales, most dense and rather brighter on the anterior border of the mesothorax; scutellum blackish, with narrow pale curved scales and deep brown border bristles; metanotum deep black; pleurae black, with patches of white scales.

Abdomen steely-black, with basal pale creamy-yellow bands, the rest of the abdomen covered with dusky-black scales; border bristles pale, *alternately short and long*; numerous long lateral hairs also present; venter, with the bases of the segments, broadly banded with pale ochraceous.

Legs deep brown, almost black, with a small white knee spot; ochraceous when denuded; hind metatarsus considerably longer than the hind tibia; unguis equal and simple.

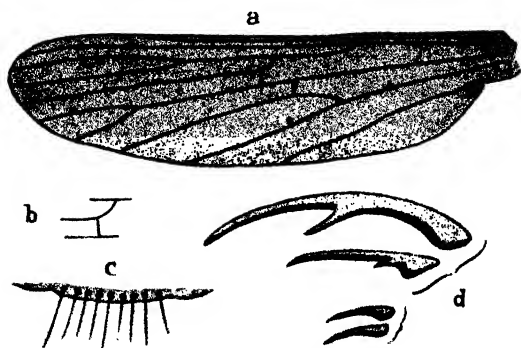


Fig. 224.

*Culex Fouchowensis*. n. sp.

a, Wing of ♀; b, cross-veins; c, scutellum; d, ♂ unguis (fore and hind).

Wings with the veins covered with small brown median scales and dense long lateral ones; first sub-marginal cell much longer

and narrower than the second posterior cell; its base nearer the base of the wing than that of the latter, its stem equal to nearly half the length of the cell, considerably shorter than the stem of the second posterior cell, which is longer than the cell; posterior cross-vein about two and a half times its own length distant from the mid cross-vein; sub-costal joins the costal nearer the apex of the wing than the base of the first sub-marginal; black bristles close to the base of the first long vein.

Halteres ochraceous-brown.

*Length*.—3·8 to 4 mm.

♂. Head as in the ♀; palpi dark brown, the last two joints nearly equal, the penultimate joint and the base of the apical joint pure white scaled below, there is also a pale yellow band towards the base; the last two joints and apex of the antepenultimate joint with short rather thick black hairs; antennae banded black and white, the two long apical joints dark brown; plume hairs deep brown; proboscis brown, quite black towards the tip.

Thorax as in the ♀.

Abdomen with basal pale creamy bands, that on the seventh expanding laterally; densely hairy.

Legs as in the female; fore unguis unequal, both uniserrated, those of the mid legs the same, but the larger one more curved; those of the hind legs very small, equal and simple.

*Length*.—3·5 mm.

*Habitat*.—Fou Chow (Rennie) (84).

*Time of capture*.—August.

*Observations*.—A very obscure species, but I think quite distinct. It comes near *C. fatigans*, Wiedemann, but the thorax has no linear stripes and the abdomen is much blacker.

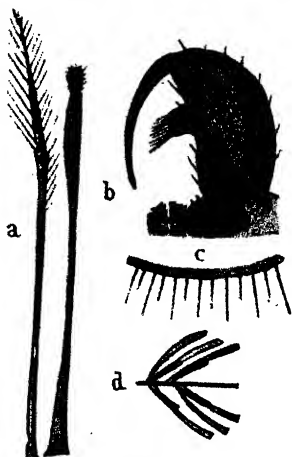


Fig. 225.

*Culex Fouchowensis*, n. sp.

a, Male palpus and proboscis; b, genitalia; c, border-bristles of abdomen; d, wing scales.

## 114. CULEX NIGRITULUS. Zetterstedt.

(Dipt. Scandinaviae, t. ix. (1850).)

Thorax dark brown, with thin golden-brown curved scales, paler on each side of the scutellum. Abdomen dusky brown, with indistinct pale basal bands, widest in the middle, sometimes dull white, at others, when worn, cinereous; venter dusky, with narrow faint pale basal bands. Legs brown, coxae, bases and venter of femora pallid; unguis of ♀ equal and simple; of the ♂ the fore and mid unguis are unequal, uniserrated; the hind ones equal and simple. A small delicate species 3·5 to 4 mm. long.

♀. Head dark brown, with pale golden curved scales and a pale clear border round the eyes; flat whitish scales at the sides of the head; black upright forked scales before the white lateral patches and brown ones behind; eyes purplish-black; antennae blackish-brown, basal joint bright ferruginous, but dark on the inner side, the base of the second joint also ferruginous; palpi dark brown; proboscis covered with brown scales, darker towards the apex.



Fig. 226.

*Culex nigritulus*, Zett.

Fore and hind unguis of the ♂ and head.

Thorax dark brown, with scattered thin golden-brown curved scales, rather paler on each side of the bare patch in front of the scutellum, bristles black; scutellum brown, with pale curved scales and black border-bristles, seven to the mid lobe; metanotum dull chestnut-brown; pleurae pallid, with a few white scales.

Abdomen dusky-brown, with indistinct basal dull whitish flaxen bands, which are widest in the middle, especially in the apical segments; when viewed under the microscope the abdomen appears ochraceous-brown and the dusky scales become dull violet; venter dusky-brown, with narrow faint basal bands.

Legs brown, coxae pale, also the bases and under-sides of the femora; a faint yellow knee spot and another at the end of the tibiae; metatarsi and tarsi darker brown, the whole with sometimes a bronzy ochraceous tinge; unguis equal, small and simple.

Wings with the veins covered with brown scales, the lateral ones long and thin and present on all the veins except the fifth long vein and its inner branch; the first sub-marginal cell is longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the latter, its stem very short, a little more than half the length of that of the second posterior; posterior cross-vein rather more than its own length distant from the mid cross-vein; halteres pale, the knob covered with pale creamy scales.

*Length*.—3·5 to 4 mm., with proboscis 5·5 to 6 mm.

♂. Head black, with long curved yellowish scales, ochraceous upright forked ones behind and white flat ones at the sides; palpi longer than the proboscis, brown, a small white apical band on the penultimate joint and another pale band towards the base; hair tufts dark brown; proboscis dark brown, expanded



Fig. 227.  
*Culex nigrifolius*, Zett. (♀).  
(X. 9.)



Fig. 228.  
*Culex nigrifolius*, Zett.



Fig. 229.  
*Culex nigrifolius*, Zett. (♂).  
(X. 9.)

at the tip; antennae banded black and white, plume-hairs flaxen at the base and black apically, entirely black in some lights. Ungues of the fore and mid legs unequal, all uniserrated; in the hind legs small, equal and simple.

*Length*.—3·5 to 4·5 mm.

*Habitat*.—Scandinavia (Zetterstedt); England (F. V. T.).

*Time of appearance*.—July in England.

*Observations*.—This is one of the smallest of our European mosquitoes, and looks very distinct from *C. pipiens*, but when one comes to examine them, however, the structural differences seem very slight. The abdominal banding is not nearly so distinct as it is in *C. pipiens*, and the gnats are much smaller and more delicate. Moreover, one never sees these small *Culices* in the house, but I have taken them in great numbers in and over half-filled water-butts. I can detect no difference in the ♂ unguis or any important structural detail from *C. pipiens*, yet it is quite distinct in appearance and habits.



## 115. CULEX RESTUANS. n. sp.

Thorax bright chestnut-brown, with golden-brown curved scales and two round pale spots on the mesonotum and a patch of pale scales just in front of the root of the wings, and paler scales around the bare space in front of the scutellum. Abdomen dusky brown, with basal bands of yellow and pure-white lateral spots. Legs bronzy-brown to black, except coxae, bases and venter of femora, which are very pale, and also a yellow knee spot. Ungues of the ♀ equal and simple.

♀. Head black, with numerous pale creamy curved scales and black upright forked ones, with flat white scales at the sides of the head; palpi black, greyish at the tip; antennae with the basal joint and base of the second joint testaceous, remainder blackish-brown, with pale pubescence; clypeus and proboscis brown.



Fig. 230.

Thorax of *Culex restuans*. n. sp.

Thorax bright chestnut-brown, with short bright golden-brown curved scales and two round spots on the mesonotum of pale creamy scales, the bare patch in front of the scutellum surrounded by almost white scales, and another patch on each side just in front of the wing roots, three rows of black bristles, the median one ending in front of the bare patch in front of the scutellum; scutellum pale; metanotum ochraceous-brown; pleurae pale testaceous, with four patches of white scales.

Abdomen ochraceous, covered with dusky-brown scales, the bases of the segments having a band of creamy-yellow scales, with a pure-white spot on each side of the segments; first segment ochraceous, with two median tufts of blackish scales and long golden hairs; second segment with the white scales forming a median line half across the segment; the abdomen densely clothed laterally with pale golden hairs.

Legs with the coxae, bases, and under-sides of the femora almost white, remainder deep bronzy-brown to almost black, there being, however, a very distinct yellowish knee spot; claws equal and simple.

Wings almost exactly as in *C. pipiens*. Halteres with pale ochraceous stem and fuscous knob.

Length.—6 mm.

*Habitat*.—Toronto, Ontario, Canada (E. M. Walker) (66).

*Time of capture*.—June.

*Observations*.—Very closely related to *C. pipiens*, but I think distinct. It differs in the basal banding of the abdomen being uniform, and not curved; in the presence of very plain white lateral spots; in the yellower tinge of the whole body, and especially in the deep golden-brown thoracic scales and paler ornamentation.

A single ♀ only received, taken on a window-pane.

I do not know if Walker described this species; I can find no record of it. A specimen is so named in the old Museum collection by Walker, and, as it is certainly distinct, and a fresh specimen has come to hand, I retain his name.

116. *CULEX ZOMBAENSIS*. n. sp.

Thorax deep brown, with narrow curved bright brown scales and two narrow dark parallel bare lines wide apart. Abdomen dark dusky-brown, with narrow basal grey bands. Legs brown, unbanded; knee spot creamy-white, also the apex of the tibiae; hind metatarsi the same length as the hind tibiae. Ungues of the ♀ equal and simple. Wings with the first sub-marginal cell with a very short stem like *C. pipiens*, but not quite so short.

♀. Head brown, with narrow curved pale scales, and almost white ones at the sides, and numerous black upright forked ones; clypeus dark brown; palpi black, with a small apical joint (?), and the penultimate joint very large; proboscis deep brown in the middle, black at the base and apex, labellae pointed; antennae deep brown.

Thorax dark brown, with narrow curved bright brown scales thickly scattered over it, and with two dark parallel widely separate lines in front of the mesonotum, very indistinct in some specimens, with golden bristles projecting over the head, and three rows of black ones on the mesonotum, and numerous black ones over the roots of the wings; scutellum pale brown, with pale creamy curved scales and with eight bristles to the median lobe; metanotum chestnut-brown; pleurae ochraceous-brown, with patches of dull white scales.

Abdomen covered with deep dusky-brown scales, each segment with a narrow pale basal band with a few grey scales, and with pale golden border-bristles, which give the basal bands an

ochraceous tinge when examined with a hand-lens; first segment dull ochraceous, with two patches of black scales and long pale hairs; base of the second segment with a clear deep nude ochra.

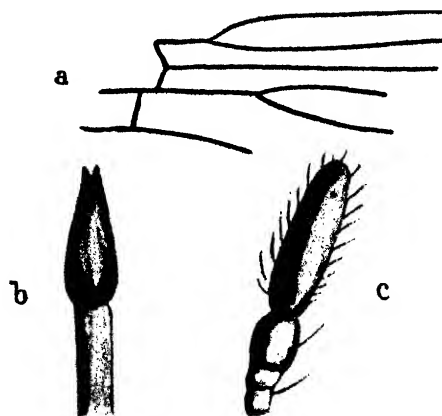


Fig. 231.

*Culix Zombaensis*, n. sp.

a, Cross-veins and fork-cells; b, apex of proboscis;  
c, ♀ palpus.

ceous band, probably covered with grey scales; the last four segments have clear white basal lateral spots; venter with numerous white scales.

Legs deep brown, femora with a yellow knee spot, and also a more or less yellow spot at the apex of the tibiae; venter of the femora and coxae pale ochraceous; *hind metatarsi the same length as the hind tibiae*; unguis rather small, equal and simple.

Wings clear, with brown-scaled veins, scales similarly disposed to those of *C. pipiens*, the second long vein being entirely clothed with long lateral scales, also the third and a greater part of the fourth, except at its base, and a few occur on the upper branch of the fifth; the first sub-marginal cell longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the second posterior cell; its stem about one-fourth the length of the cell, shorter than the stem of the second posterior, which is equal to a little more than half the length of the cell; posterior cross-vein not quite its own length distant from the mid cross-vein; halteres with ochraceous stem and slightly fuscous knob.

*Length.* —5 mm.

*Habitat*.—Zomba, British Central Africa (Gray) (83).

*Time of capture*.—January (23. 1. 00).

*Observations*.—Described from three ♀'s. This is rather an obscure species, closely related to *Culex pipiens* and *C. fatigans*, but I think clearly distinct from both. From *C. pipiens* it differs in the small grey abdominal basal banding and the different scale structure of the thorax; from *C. fatigans* by the much greater length of the first sub-marginal cell, which is nearly as long as in *C. pipiens*, and by the hind metatarsi being the same length as the hind tibiae. The banding of the abdomen in one specimen is only represented by a few grey basal scales, the abdomen being very dark. There is also a resemblance to *C. univittata*, but the femoral and tibial spots are not nearly so prominent, and orange-yellow instead of pure white.

117. *CULEX REESII*. n. sp.

Head mostly grey scaled; thorax dark brown, with two pale parallel stripes when denuded, covered with pale golden scales, and with a broad median dark line of deep brown scales. Abdomen deep brown, with pale creamy-white basal bands, often dull. Legs dark brown, unbanded, except the bases and venter of the femora, which are pallid. Venation much as in *C. pipiens*, but the stem of the first sub-marginal cell longer. Ungues of ♀ equal and simple.

♀. Head dark brown, with grey curved scales and black upright forked ones, pale grey round the eyes; proboscis dark brown, pale at the tip; palpi short, densely black scaled; antennae dark brown, with pale pubescence and dark hairs, slightly testaceous at the base; clypeus deep brown.

Thorax almost black, showing when denuded two paler parallel lines; the sides in front covered with pale golden narrow curved scales; over the roots of the wings the scales are curved and hair-like, and more dense than in front, a curved dark line apparently separating the two areas; the middle of the mesonotum with a broad darker scaled line, the scales being more or less bronzy and flatter, and applied more closely to the surface; there are also pale grey curved scales in front of the scutellum and just over the roots of the wings; numerous black bristles, especially over the roots of the wings; scutellum deep brown, with narrow pale golden, almost grey

curved scales; median lobe with six border-bristles, the two median ones crossed; metanotum brown; pleurae pale brown and grey.

Abdomen deep dull ochraceous and steely when denuded, covered with dusky-brown scales, the bases of the segments with median pale ochraceous patches of scales; venter densely covered with pale ochraceous scales; first segment with two patches of black scales and densely hairy.

Legs unbanded; coxae pale ochraceous; legs deep ochraceous when denuded, covered with small brown scales, the ground colour showing more or less in the femora, which are paler beneath; unguis of the fore and mid legs curved, equal and simple, of the hind nearly straight.

Wings with the veins covered with brown scales, the median flat ones small, the lateral ones thin and long, very like *C. pipiens*; the first sub-marginal cell considerably

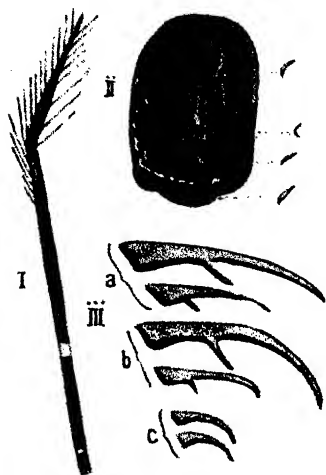


Fig. 232.

*Culix Reesii*. n. sp.

I. Male palpus; II. thorax of ♀;  
III. male unguis.

narrower and longer than the second posterior cell, its base much nearer the base of the wing than that of the second posterior cell; its stem a little less than one-third of the length of the cell; stem of the second posterior not quite half the length of the cell; posterior cross-vein twice its own length distant from the mid cross-vein; sub-costal joins the costal a little before the base of the first sub-marginal cell; fringe brown; halteres with a grey stem and fuscous knob.

Length.—5.5 mm.

♂. Head dark brown, with numerous creamy-grey curved scales, the median ones being rather clavate, small flat white ones at the sides, and numerous small black upright forked ones; a narrow border of pale scales around the eyes; the sides of the head seem dark-scaled; a tuft of a few yellow bristles project forwards; antennae banded, brown and white, with deep brown verticils; palpi ochraceous, with almost black scales, the last two joints with bristles, and also a few on the antepenultimate joint; a pale band on the basal third, and a small white one near the

base; last two joints nearly equal; proboscis deep brown, slightly pale at the apex.

Thorax much as in the ♀; mid lobe of the scutellum with seven border-bristles.

Abdomen narrow, with distinct pale ochraceous basal bands, which on the last two segments spread down laterally; with long dense golden-brown hairs.

Legs as in the female; fore unguis unequal, uniserrated, the larger slightly curved; in the mid legs the larger is rather more curved; hind unguis small, equal and simple.

*Length*.—4.5 to 4.8 mm.

*Habitat*.—Hong Kong (Dr. Rees).

*Time of capture*.—October.

*Observations*.—Described from two ♀'s and two ♂'s sent me by Dr. Rees, in his Hong Kong collection. At first sight they might be mistaken for *Culex pipiens*, but the one fair specimen shows the thorax to be very differently ornamented, there being a median dark-scaled line of considerable breadth, and the scales in front of the wings are dense and hair-like, quite different from those at the sides in front; the stem of the first sub-marginal cell is also relatively much longer, and more nearly approaches *C. fatigans* in venation, but it is quite distinct in thoracic ornamentation. One specimen shows the bases of the abdominal segments to be nearly completely banded with pale ochraceous scales. The one from which this description is drawn has the abdomen partly denuded, and may possibly have been the same. It also resembles *C. sericeus*, mihi, from the same locality, but again the thoracic ornamentation should readily separate them, and the stem of the first fork-cell is much shorter in this species than in *C. sericeus*.

#### 118. *CULEX SERICEUS*. n. sp.

Thorax dark rich brown, with narrow curved dusky-bronze scales, with a narrow median dusky line and a linear dusky patch on each side in front. Abdomen dark brown, with dull ochraceous basal bands, often indistinct. Legs brown, the femora ochraceous, mottled with brown scales. Head dark brownish-black, with a distinct white border in front.

♀. Head black, with dusky-brown narrow curved scales and black upright forked ones; around the eyes and generally in front a distinct border of white scales, which expand into a

flat scaled white lateral patch; antennae dark brown; palpi short and thick, almost black; proboscis deep brown, black at the apex, which is rather expanded.

Thorax deep rich brown, with a dark median line and two lateral dark linear patches in front of the mesonotum, each separated from the median dark line by a broad paler line; mesonotum covered rather densely with dull bronzy-brown narrow curved scales and with numerous dark brown bristles at the sides, especially near the wings; scutellum brown, testaceous laterally, with similar scales to the mesonotum; with apparently five large bristles to the mid lobe; metanotum deep brown; pleurae with two dark brown spots above, frosty, cinereous below, with a few dark bristles.

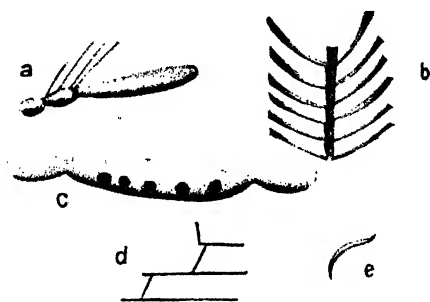


Fig. 233.

*Culex sericeus*, n. sp.

a, ♀ palpus; b, wing scales; c, scutellum; d, cross-veins; e, thoracic scale.

Abdomen pale steely when denuded, covered with deep brownish scales; with basal bands of dull ochraceous scales, which are slightly expanded in the middle, and which are often indistinctly seen; posterior border-bristles very dark brown; first segment with two small median patches of dark scales.

Legs long and thin, with the coxae frosty grey, with a few black bristles; femora ochraceous, with brown scales, remainder of the legs deep brown.

Wings with yellowish-brown scaled veins; median scales small, lateral ones linear, but rather short; fork-cells long; the first sub-marginal a little the longer and slightly narrower, its base a little nearer the apex of the wing than the base of the second posterior cell; stem of the first sub-marginal cell rather longer than that of the second posterior cell, not quite half the length of the cell; stem of the second posterior also not quite

half the length of the cell; posterior cross-vein distant about twice its own length from the mid cross-vein; supernumerary and mid not quite united; sub-costal joins the costal about the base of the first sub-marginal cell; fringe brown.

Halteres with grey stem and fuscous knob.

*Length*.—5 mm.

*Habitat*.—Hong Kong.

*Time of capture*.—October.

*Observations*.—Described from a single ♀ in Dr. Rees' collection from Hong Kong. It bears some resemblance to both *C. pipiens* and *C. Reesii*, the latter from the same locality. The thoracic ornamentation should at once separate it, however, and the head is peculiarly marked, the occiput being dusky, a broad pale grey band surrounding the head in front. The legs are rather long and thin; more so than in either of the two other mentioned species.

# 119. CULEX FLAVIPES. Macquart (1838).

*C. scrocinus*. Philippi (1865).

*C. molestus*. Kollar (?), 1832.

(Dipt. Exot. i. 1, 35, 5 (1838), Macquart; Hist. fio. y polit. de Chile, Zool. vii. 332, 1 (1852), Blanch.; Verhandl. zool.-bot. Gesellsch. xv. 595, 1 (1865), Philippi; An. Soc. Cient. Arg. x. 6, 1 (1880), Arribalzaga; Catal. 4, 3 (1883), et Bol. Acad. Arg. iv. 112 (1882), Arribalzaga; Aufzahl. d. Chile, Dipt. i. 1 (1865), Philippi (= *scrocinus*); Trans. Linn. Soc. Lond. xvii. 331, 1 (1837), Walker; Dipt. Arg. 528 (1891), Arribalzaga; Bras. vorz. tast Ins. 187, f. 13 (1832), Kollar (= *molestus*).

Thorax rufous, with *minute* curved golden scales and with two parallel median fuscous lines. Abdomen fuscous with basal yellow bands; venter ochraceous, with pale scales. Legs yellow at the base; tibiae and tarsi clothed with fuscous scales; ungues of the ♀ equal and simple.

♀. Head brown, with numerous dull golden curved scales and forked upright fuscous ones, a pale creamy border round the eyes, and a pale flat-scaled patch on each side; proboscis deep brown at the tip, ochraceous-brown at the base; palpi ochraceous, covered with deep brown scales; antennae pale brown; basal joint bright testaceous; clypeus brown.

Thorax reddish-brown, with two dusky median parallel lines on its surface, and covered sparsely with very small curved golden-brown to golden scales, with numerous fuscous bristles



laterally over the roots of the wings and on each side of the bare space in front of the scutellum; some of these bristles, especially those in front, have a yellowish tinge; scutellum ochraceous-brown, with narrow pale curved scales and seven median border bristles; metanotum bright testaceous-brown; pleurae pale testaceous-brown, with some dusky and frosty patches.

Abdomen pale steely-brown when denuded, covered with fuscous to warm brownish scales, each segment with a basal band of yellow scales and with a row of pale posterior border-bristles; the basal bands spread out laterally into paler lateral spots, continuous with the bands; venter pale ochraceous, with pale scales.

Legs pale yellowish, with fuscous scales; coxae, bases, and venter of the femora pale yellowish; apex of the femora, tibiae and tarsi brownish-fuscous, owing to the covering of scales; femora, tibiae and metatarsi more or less bristly; ungues equal and simple.

Wings with brown scales of typical *Culex* form; first submarginal cell considerably longer and slightly narrower than the second posterior cell, its base considerably nearer the base of the wing than that of the second posterior cell, its stalk very short, about one-fifth the length of the cell, like *C. pipiens*, shorter than the stalk of the second posterior cell; stem of the second posterior cell not quite half the length of the cell; middle and supernumerary cross-veins united, sometimes *apparently* in one line, really at a very open angle; posterior cross-vein distant from the mid cross-vein from its own length to twice its own length. Halteres with a pale stem and fuscous knob.

*Length*.—4 to 6 mm.

*Habitat*.—Chares, Lower Amazon (Austen); Chili (Macq.); Brazil (Kollar) (?); South Provinces, Argentine (Blanch.); Uruguay (Walker); Argentine (Arribalzaga).

*Time of capture*.—February.

*Observations*.—After examining a large number of South American mosquitoes, I have been obliged to assume that the species described by Macquart is a variable one, and hence none that I have seen exactly agree with either Arribalzaga's description of Macquart's species or with what Giles states in reference to the type.

The specimens I take to be this species, and from which this description is compiled, came from the Amazon region.

The character which I think gives their identity is that the *rufous thorax has two median parallel dusky lines*. It cannot be confused with *Culex fatigans*, Wiedemann, because the thoracic

scales are very minute curved thin structures, whereas in *C. fatigans* they are broader and much larger.

Arribalzaga describes the antennae as being dull yellow; those I have seen have them brown, and the basal bands, he says, are clothed with white scales; the Amazonian specimens have the scales pallid yellow. Giles says the type in the Jardin des Plantes has the supernumerary and mid cross-veins in one line; I have frequently seen the cross-vein look thus in this species when held in a certain position, but in no case do the stems of the fork-cells equal one another. I have seen no species from South America in which they do.

In the ♂, which I have not seen, Arribalzaga says the unguis are all simple.

The Amazonian species only measures 4 mm.; Arribalzaga says 4 to 6 mm.

Regarding this species, Arribalzaga says "it is just like *C. pipiens*, and it is also closely related to *C. pallipes* of Macquart, and that of Meigen. It does not differ superficially from the type of my genus *Heteronychia (dolosa)*, but a short examination of the unguis enables one to recognise not only its specific but generic status, the unguis being small and simple in both sexes." The *Culex flavipes* is found in large towns and inhabited places. The female, when caught, has the abdomen full of blood, and it turns violet-black when dry.

#### 120. *CULEX FATIGANS*. Wiedemann (1828).

*Culex aestuans*. Wiedemann (1828).

*Culex pungens*. Wiedemann (1828) (?).

*Culex pallipes*. Meigen (1838).

*Heteronychia dolosa*. Arribalzaga (1896).

(Auss. Zweifl. Ins. p. 10, Wiedemann; Hd.Bk. Mosq. p. 299, Giles; Syst. Besch. Siebenter Th. oder Supple. (1838) (= *pallipes*), Meigen; Dipt. Argent. p. 56 (= *H. dolosa*), Arribalzaga; Auss. Zweifl. Ins. p. 9 (= *pungens*), Wiedemann; Bull. 25th N. Se. U. S. Dept. Agri. p. 22, &c. (1900) (= *pungens*), Howard.)

(Figs. 114 and 115, Pl. XXIX.)

Thorax brown, with two distinct dark lines on the denuded surface, covered with pale golden curved scales and with two more or less distinct bare parallel dark lines, and three rows of dark bristles, ornamentation variable. Abdomen dark brown to black, with basal white or pale creamy curved bands and

white lateral spots; venter white or yellow scaled. Legs dark brown; bases of the femora and coxae pale, knee spot and sometimes the apex of the tibia with a faint yellow spot; unguis of the ♀ equal and simple; in the ♂ the fore and mid unguis are unequal and uniserrated, the hind equal and simple. Wings with the first sub-marginal cell longer and narrower than the second posterior cell, its stem variable in length, never less than one quarter the length of the cell; posterior cross-vein distant twice (or more) its own length from the mid cross-vein.

♀. Head brown, covered with pale golden-brown to creamy curved scales and a few scattered black, dark brown, and occasionally ochraceous upright forked scales, flat creamy-white scales laterally, and a faint pale narrow border round the eyes, numerous black and brown bristles; antennae dark brown, with pale pubescence; basal joint pale ferruginous to ochraceous, basal half of the second joint pale ferruginous; palpi densely covered with deep brown scales, and in some specimens with a few pale grey ones, and with numerous small black bristles; proboscis covered with dark brown to violet-black scales, sometimes paler in the middle, and with a pale apex.

Thorax brown, with two darker lines on the denuded surface, sometimes with traces of a third median line, covered with bright golden to pale golden or almost fawn-coloured curved scales, some being rather broader than others; there are also three rows of black bristles, the median one ending at the bare space before the scutellum; scutellum dull ochraceous, with pale golden to creamy curved scales and brown border-bristles, which vary in number on the median lobe; metanotum pale chestnut-brown, in some specimens with darker markings; pleurae pale testaceous, with three or more small patches of pale, almost white scales.

Abdomen covered with brown to deep purplish-brown or almost black scales, each segment with a basal white band rather expanded in the middle, and with white lateral patches, which show especially in gorged specimens; posterior borders of the segments with pale golden-brown hairs; venter with numerous dull white scales; the first abdominal segment is dull ochraceous-brown (black in gorged specimens), with two patches of dull violet-black or ochraceous scales and numerous golden-brown hairs.

Legs with the coxae deep ochraceous; femora deep brown above and at the apex, grey beneath, and tipped with a few yellow scales; tibiae deep brown, with a deep ochraceous apical spot (sometimes absent), and with pale dull brown bristles;

metatarsi and tarsi deep brown to almost black, with dull ochraceous reflections in some specimens; hind metatarsi a little shorter than the hind tibiae; unguis equal, simple, and of moderate size.

Wings longer than the abdomen, the veins clothed with brown and purplish-brown scales; long scales on the whole of the second and fourth long veins, also on the third, the upper branch of the fifth, and the end of the sixth, as well as on both the branches of the fork-cells; the first sub-marginal cell longer and slightly narrower than the second posterior cell, its stem short, always more than one-fourth the length of the cell; the stem of the second posterior cell longer than that of the sub-marginal cell, but not nearly as long as its fork; the posterior cross-vein a little longer than the mid cross-vein, distant from the latter always more than its own length, usually about twice its own length distant. Halteres ochraceous, slightly fuscous at the top.

*Length*.---4.5 to 5.5 mm.

♂. Head ornamented as in the ♀; antennae deep umber-brown, with pale bands and deep brown verticillate hairs; basal joint large, pale ochraceous; palpi deep ochraceous, covered with brown scales, with a single pale band towards the basal third, longer than the proboscis by the last joint and nearly half the penultimate joint, the last joint tapering to a point, just a little



Fig. 234.  
*Culex fatigans* (♂). (X. 9.)  
(Queensland.)

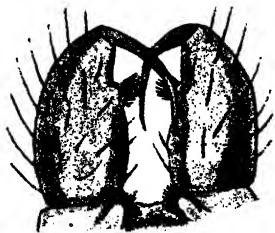


Fig. 235.  
*Culex fatigans*, Wied.  
♂ genitalia.

longer than the penultimate joint; clothed on each side of the last two joints with moderately long but scanty dark brown hairs, which also exist at the apex of the antepenultimate joint; proboscis deep ochraceous, swollen towards the apical end, covered with deep purplish-brown scales; apex testaceous, sharply acuminate.

Abdomen narrow, covered with brown scales, deep purplish-brown to almost black in some specimens, with basal white

bands, which on the last few segments spread out laterally; venter with grey or dull white scales, clothed above and laterally with numerous golden-brown hairs.

Wings with the bases of the fork-cells nearly level; the first sub-marginal cell from one and a half to two and a half times as



(Punjab.)



(Adelaide.)

Fig. 236.

Wings of *Culex fatigans* (♂). (X. 9.)

long as the stem; stem of the second posterior cell about as long as the cell; posterior cross-vein about twice its own length distant from the mid cross-vein.

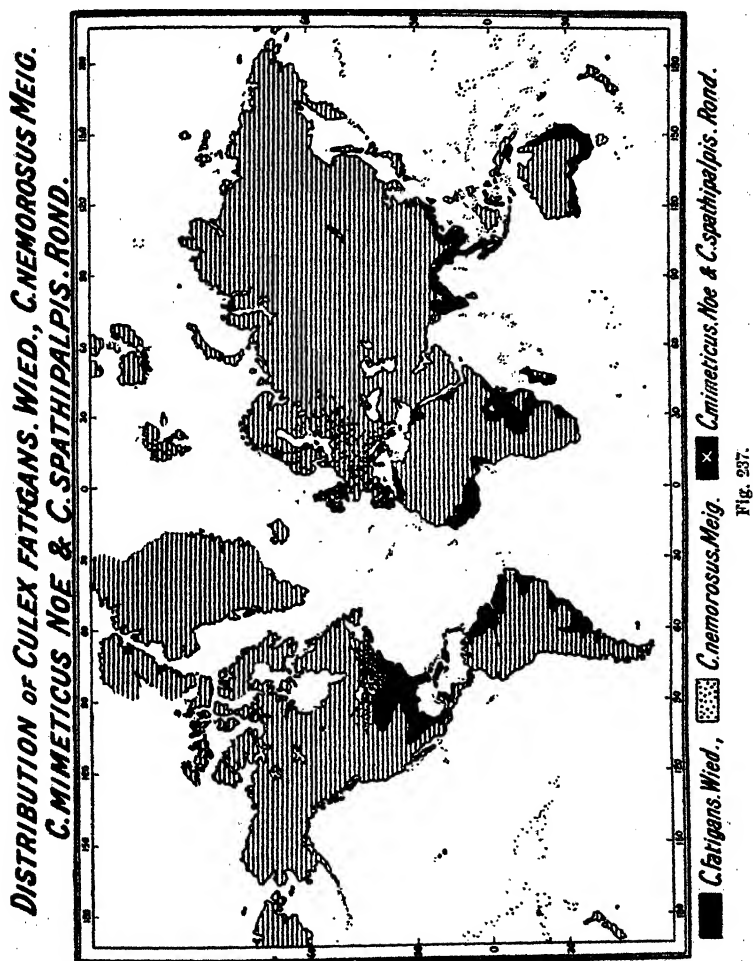
Legs rather more ochraceous than in the ♀; fore and mid unguis unequal, dark brown to black; in the fore legs both are toothed, the larger one having a long blunt tooth about the middle, the smaller a sharp-pointed one towards the base; in the mid legs the unguis are very similar, but the larger tooth is a little more curved; hind unguis equal, small, moderately curved.

*Length*.—4 to 5 mm.

*Habitat*.—Madras (Goodrich) (12. 12. 1899); Calcutta (Daniels) (6. 3. 1899); Quilon, Travancore (James); Naini Tal (Giles); Bengal (Green); Singapore (Hanitsch) (4. 9. 1899); Hong Kong (Ford) (8. 1. 1900); Straits Settlements (Wray); Fou Chow (Rennie); St. Vincent, West Indies (Powell) (25. 5. 1899); St. Lucia (St. G. Gray) (25. 5. 1899); Montserrat (Norris) (7. 7. 1899); Jamaica (Grabham) (8. 2. 1900); Panama (Mallet) (22. 9. 1900); Para (Churchill) (12. 4. 1899); Demerara (Quelch) (16. 6. 1899); Rio de Janeiro (Lutz) (4. 7. 1899); Buenos Ayres and Argentine generally (Arribalzaga); Bermuda (Harvey) (16. 8. 1899); Durban (Christophers) (12. 2. 1899); Mombasa (McKay) (76); Pemba Island, East Africa (Dr. R. O. Sullivan-Beare) (11. 10. 1899); Bupengary, Queensland, (Bancroft); Australia, widespread (Skuse); Gibraltar (Birt); Portugal and Spain (F. V. T.); Egypt (Meigen); United States (Massachusetts, Maryland, Columbia, New York, Illinois, Minnesota, Nebraska, Kentucky, Texas, Virginia, New Jersey, Connecticut, &c.); Cuba (Lazear); Upper Burma (Watson) (94. 4); Punjab (Datta) (73); Senegambia (Rees) (73); New Amsterdam (Rowland) (61); British Honduras (74); Belize (9. 99); Fiji (Joynt)

(68); Zozufferpur, Behar, Bengal (Green) (88); Nairobi, Zanzibar (Mackinder) (85); Mukerian, Hoshiarpur, India (Datta) (97).

*Date of capture.*—In Hong Kong and Singapore in July; Para in March and May (Churchill); Demerara in April and May (Quelch); St. Lucia in May (St. G. Gray); Jamaica in



December (Grabham); Durban in January (Austen); Pemba Island, East Africa, in August (O. Sullivan-Beaure); Mombasa in May; Bermuda in July (Harvey).

The following dates are given by Howard in America: Massachusetts, September to November; Maryland in November

and December ; District of Columbia in January, March, May, June, July, August, October, November, and December ; New York in May, July, and August ; Virginia in June and October ; New Jersey in May ; Texas in May, &c., &c.

#### SUB-SPECIES AND VARIETIES.

A very large number of mosquitoes have been received from almost all parts of the world in tropical and sub-tropical climates, and from some of the warmer temperate zones, which present a certain similarity in general appearance, and which present no important structural differences from one another. These all centre round the East Indian species which was described by Wiedemann as *Culex fatigans*. A typical specimen of this species has been described from this region.

Even in this region the species is subject to considerable minor differences in colour, in size, and in chaetotactic characters, whilst some of those from distant localities present more marked variability from the type. After examining the wings, palpi, genitalia, unguis, the scale structure and the chaetae of the scutellum in some hundreds of specimens from different parts of the world, I am forced to place them all under Wiedemann's species. In regard to the unguis, ♂ genitalia, palpi, and scale structure, they all agree, but there is considerable variation in the relative lengths of the two fork-cells and in the number of chaetae in the middle lobe of the scutellum. I hoped the latter structure would prove of specific importance, but after tabulating numbers of specimens I found that the chaetotactic characters of the scutellum failed ; and this was particularly emphasised in specimens from certain districts in which I found the number of chaetae in the mid lobe now and then augmented by a smaller one, either a remnant of a degenerating spine or the rudiment of a new one, which, I could not decide. The number of chaetae in the mid scutellar lobe varies, I find, from six to ten ; this latter number occurred only in some specimens from New Amsterdam. As instances of the variability in this respect, I may quote the following from my notes :—

St. Vincent	.	.	♀	7	mid	scutellar	bristles.
"	.	.	♂	6	"	"	"
Montserrat	.	.	♀	8	"	"	"

Demerara	.	.	♀	8	mid	scutellar	bristles.
"	.	.	♂	6	"	"	"
Para	.	.	♀	7	"	"	"
"	.	.	♂	6	"	"	"
Bermuda	.	.	♀	6	"	"	"
"	.	.	♂	7	"	"	"
Gibraltar	.	.	♀	8	"	"	"
"	.	.	♂	6	"	"	"
Durban	.	.	♀	8	"	"	"
"	.	.	♂	6	"	"	"
Pemba Island	.	.	♀	7	"	"	"
"	.	.	♂	8	"	"	"
Madras	.	.	♀	6	"	"	"
"	.	.	♂	6	"	"	"
Singapore	.	♂ and ♀	7	"	"	"	"
Fou Chow	.	♂ and ♀	6	"	"	"	"
Bengal	.	.	♀	9	"	"	"
Queensland	.	.	♀	7	large, 1 small	mid scutellar	bristles.
"	.	.	♂	7	large, 1 small	mid scutellar	bristles.

Such variations rendered these usually constant specific characters valueless.

With regard to venation, it may be roughly said that the stem of the first sub-marginal cell is never less than one-fourth the length of the cell. Varieties in the length of the stem vary, however, as follows, in the ♀ :—

Singapore	.	cell	$2\frac{1}{2}$	times	length	of	stem.
St. Lucia	.	cell	$3\frac{1}{4}$	"	"	"	"
St. Vincent	.	cell	$2\frac{1}{2}$	"	"	"	"
Adelaide	.	cell	3	"	"	"	"
Durban	.	cell	4	"	"	"	"

Every gradation in between the  $2\frac{1}{2}$  and 4 limits could be found, whilst specimens from the same locality vary also. It will be noticed I have made use of the relative length of the veins in some species. In certain species certain veins are constant; for instance, in *Culex pipiens* the relative length of the stem of the sub-marginal cell has been found to scarcely vary at all. This I take to be a fixed character, and thus of specific value.



whereas the relative position of the posterior cross-vein in that species varies to a slight extent even in the two wings of one specimen.

Neither the venation nor the number of mid scutellar chaetae can then be taken into account in dealing with this group of *Culex*.

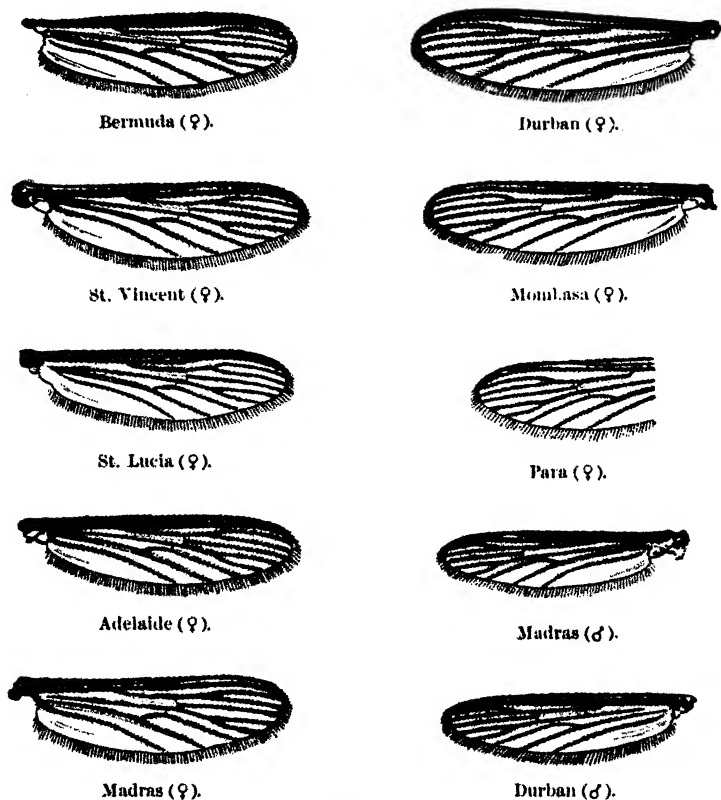


Fig. 238.

Wings of *Culex fatigans* (♂ and ♀). (X. 9.)  
(Showing variation in the fork-cells and their stems.)

Another point of considerable variation is to be found in the first abdominal segment. Specimens from Madras, Singapore, Queensland, Mombasa, &c., have two patches of dusky scales on the first segment; specimens from Calcutta, Hong Kong, Punjab, Singapore, Queensland, Adelaide, Pemba, &c., have white scales on this segment; some of those from Bermuda, Durban,

Fou Chow, Bengal, &c., black and white; and some sent from Gibraltar, Hong Kong, &c., have now black and now pale scales.

Ungues, ♂ genitalia and palpi I find constant. But in regard to coloration and thoracic ornamentation there is some marked variation, and I have been able to separate several sub-species in this respect, for which I propose the following names, retaining those previously given for species now sunk under sub-species of *C. fatigans* :—

A. *Type*.—Abdomen dusky black, with basal pure-white bands and basal white lateral spots; pleurae and metanotum chestnut-brown; thorax with two dark parallel lines.

B. Sub-species *luteoannulatus*. n. s. sp.

Abdomen dusky black or brown, with basal flaxen curved bands and pure-white lateral spots; pleurae and metanotum chestnut-brown; thorax with traces of two parallel bare median lines.

C. Sub-species *Macleani*. Skuse.

Abdomen brown, with basal pale flaxen to almost white bands and white lateral spots; thorax with two very clear median parallel bare lines in front, *widening out towards the fore end*.

D. Sub-species *Skusei*. Giles.

Abdomen with pale flaxen bands and white spots; the thorax with traces of four parallel bare lines.

E. Sub-species *trilineatus*. n. s. sp.

In which the median line of dark thoracic bristles shows as a third median line on the thorax.

Each of these sub-species can again be divided into varieties according to the colour of the spots on the first abdominal segment as follows :—

variety 1—with scales pale yellow.

„ 2—with scales dusky black.

„ 3—with scales pale yellow and black.

*Localities for Sub-species.*

*Macleayi* in Australia ;

*Skusii* in Australia ;

the others in widely separate areas, and may occur side by side.

The two sub-species *Macleayi* and *Skusii* are described more fully in the following pages.

*Observations.*—This species and its sub-species are very closely related to *Culex pipiens*, but can at once be told from the latter by the wing venation. It is one of the commonest mosquitoes, and is found in all parts of the world except the temperate and Arctic regions. It is essentially a household species, and may be found wherever man goes ; it is undoubtedly spread by means of steamships and trains, in which it is frequently found.

The larvae live in butts, tanks, and other small artificial collections of water. Lt.-Col. Giles, in a paper sent me for publication, says, in some notes concerning this species in India, as follows : "No rain had fallen in Lucknow for months, and the place appeared as if burnt up after the long drought. Not a single natural collection of water could be seen ; all the irregular excavations so common in India, and which usually retain a little rain-water throughout the year, being absolutely dried up. In spite of this the houses in the civil lines were simply infested with mosquitoes, which were so numerous as to be a veritable pest, of which every one was complaining, though no one appeared the least disposed to make any effort to destroy them. The reason for this enormous multiplication of mosquitoes was not difficult to discover. In Lucknow, as in the European quarters of most Indian towns, every house has its garden, which can only be maintained by irrigation, effected by means of small masonry channels carried from the well to all parts of the garden. At intervals these are interrupted by small tanks of cemented brick work, never of large size, and in fact generally about a cubic yard in capacity. There must be hundreds of these little tanks in the 'Civil Lines,' and without exception they were simply alive with the larvae and pupae of *Culex fatigans*." Dr. M. Graham, writing from Jamaica, says that "this species is found in the larval stage all the year round in ponds and tubs in Kingston." Consul Mallet, writing from Panama, says "it is one of the most common and noxious species in the city, and breeds usually in wells and uncovered water-butts."

Such seem to be the general breeding localities of this species. It is evidently everywhere a household form. Writing from Singapore, Mr. R. Hanitsch says "it is the most common domestic form here." From Hong Kong Mr. Ford writes that it "seems chiefly confined to the houses inhabited by the Chinese." At Mombasa it is one of the most troublesome and annoying mosquitoes (McKay). Dr. Lutz tells me it is the common night mosquito of Brazil, and may be found everywhere, and stings only of a night.

In Australia it is found in towns throughout the year, but is more numerous and causes most annoyance during the summer months (Skuse).

*Culex fatigans* as an intermediate host.—This is the species spoken of by Major Ronald Ross as the "grey mosquito," in which he has shown that the blood parasites known as *Proteosoma*, Labbé, undergo part of their development, and which infect birds by their bites. This and closely related species seem to be particularly predisposed to attack birds in all parts of the world, and even reptiles. An observation on this point has been sent me by Dr. Lutz.

Accounts of the part played by this species in distributing the *Proteosoma* and its development will be found in the "Indian Medical Gazette," Vol. XXXIII., Dec. 1898, and Vol. XXXIV., Jan. 1899, by Major Ronald Ross. *Culex fatigans* is also one of the intermediate hosts and carriers of the small nematode blood parasite *Filaria sanguinis-hominis*, whose life-history was discovered by Dr. Manson (vide Journal of the Linnaean Society (Zool.), XIV., pp. 301-311: "On the Development of *Filaria sanguinis-hominis*, and on the Mosquito considered as a Nurse"; also a paper entitled "The Metamorphosis of *Filaria sanguinis-hominis* in the Mosquito," Trans. Linn. Soc. Zool., 2nd Se., Vol. II., pp. 367-388).\*

This insect does not, as far as we yet know, take any part in the distribution, &c., of malaria or yellow fever.

*Synonymy*.—It is strange that this variable species has not been described under a greater number of synonymous names. At present I can only trace five insects previously described as distinct to this species.

This nematode is now known as *Filaria Bancroftii*.

Arribalzaga describes it undoubtedly from the Argentine under the name *dolosus*, and, moreover, raises it to a new genus, *Heteronycha*, which genus cannot hold, as it is a most typical *Culex*, closely related to *C. pipiens*, L., from which the genus was formulated. The description and figures of the different parts exactly agree with this species, which have been received from several parts of South America. Moreover, Dr. Lutz writes me he is sure the common night mosquito of Brazil is the same as the Indian species, which he has also found in the Sandwich Islands.

In 1838 Meigen described a species under the name *C. pallipes*, from two poor specimens from Spain. Some specimens are in the Jardin des Plantes, but they are not those from which the original description was compiled. Meigen's short description applies as far as it goes to *Culex fatigans*, and as that species occurs in Portugal, Gibraltar, &c., I think there is little doubt as to its identity. In the same work that Wiedemann describes *C. fatigans* he describes *C. aestuans* from Brazil. The differences mainly lie in that in the latter "the moderately clear brown thorax has one deeply tinted stripe," and that "in one specimen there is a trace of white banding on the tarsi." The common mosquito of Brazil is undoubtedly *C. fatigans*, which Dr. Lutz tells me shows distinct traces of pale tarsal banding when immature. I therefore feel inclined to place *aestuans* as a synonym of *C. fatigans*.

*Culex Macleayi*, Skuse, differs only in the form of the two thoracic stripes from a typical *C. fatigans*, and after comparing the Australian specimens I am confident they are only local varieties of Wiedemann's species. The same may be said of Skuse's *Culex* sp. near *ciliaris*, called by Major Giles (Hand-Bk. Mosquitoes, p. 292) *Culex Skusii*. Skuse's description agrees in all respects, except that there are four bare thoracic lines more or less parallel, and not curved as in *C. Bancroftii* (*fasciatus*), but these lines are generally very indistinct, and in some specimens cannot be seen. The series I have examined vary much in colour, a point noticed by Skuse.

I also feel certain that Wiedemann's *Culex pungens* is synonymous. Professor Howard kindly sent me specimens under this name, but they did not answer to Wiedemann's description. On the other hand, his figure of *C. pungens* (Bull. No. 25, New Series, U. S. Dept. Agri., p. 27, fig. 4, 1900) exactly resembles the common house mosquito. The genitalia of the ♂ is shown

to be the same, and the ungues in the ♂ and ♀ agree, as well as the venation, according to Coquillett's tables of North American species in the same paper.

More recently Professor Howard has sent me a series of what he has taken to be *C. pungens*. Some of these are undoubted *fatigans*, some *pipiens*, and a few seem almost intermediate, but the difference in the venation previously pointed out holds good.

Coquillett and Howard both appear to think *C. fatigans* and *C. pipiens* merge into one another, and certainly from the specimens they have sent me there is every indication of such.

Sub-species A, *Macleayi*. Skuse.

♀. Head deep brown to black, covered with thin golden curved scales, creamy upright forked ones behind in the middle, rather broader than usual, black upright ones on each side near the middle, and a narrow pale border round the eyes, ochraceous scales laterally; black bristles projecting forwards; antennae nearly black, basal joint and first half of the second joint pale testaceous; clypeus deep brown; proboscis deep brown, black in some lights, with a coppery or purple lustre; palpi covered with deep purplish-black scales with a few grey ones near the apex. Thorax deep purplish-brown, covered with narrow



Fig. 239.

Wing of *Culex fatigans*,  
sub-sp. *Macleayi*, Skuse (♀). (X. 9.)

curved golden to creamy coloured scales, with two bare lines running parallel with one another, *broadest in front*, often indistinct behind; there are also three rows of black bristles on the mesonotum; scutellum brown, with similarly shaped golden scales as the mesothorax; metathorax brown; pleurae paler than the thorax, with patches of white scales. Abdomen covered with deep purplish-brown to almost black scales, each segment having a basal band of pure-white scales more or less curved apically. Legs with a pale apical spot to the hind tibiae as well as a pale knee spot. Halteres ochraceous.

*Length*.—4.5 to 5 mm. ♀; 5 mm. ♂.

*Habitat*.—Adelaide (75), Queensland (Bancroft) (71), King George's Sound, Western Australia (Masters).

*Time of capture*.—Adelaide in November, December, and January; Queensland in August.

*Observations*.—This sub-species, like the type, is evidently a household pest, those received having been taken indoors; the Adelaide specimens were captured on the windows of the museum. The two thoracic lines should readily identify this sub-species, which seems to be very common in the southern part of South Australia, and probably all over the continent. (Some of these specimens were sent by Dr. Bancroft under the *Culex nigrothorax*, Macq. ?)

Sub-species B, *Skusii*. Giles.

*Culex* sp. near *ciliaris* (?). Skuse.

Head brown, ornamented as in the type; antennae brown, basal joint and basal half of the second joint bright reddish-yellow.

Thorax brown, clothed with golden-yellow curved scales, bare in front of the scutellum, traversed by bare lines often very indistinct, these seem to be four in number; in front is a median dark line not bare, running partly down the thorax; this has a double series of black bristles and ends at the bare patch in front of the scutellum; there are also two lateral lines of bristles, which run back to the scutellum as in *C. linealis*; scutellum dark ochraceous, with golden-yellow scales in the middle and on each lateral lobe and bordered with golden-yellow bristles, brown in some lights; metanotum light to dark brown; pleurae pale testaceous, with small indistinct patches of pale, almost white scales, pleurae evidently variable in colour.

Abdomen clothed with purplish-brown to purplish-black scales, the segments with basal bands of creamy-white to yellow scales, semicircular in form; ventrally the abdomen is covered with pale yellowish scales.

Legs with apical femoral and tibial spots. Wings with the scales very dark, with a purplish hue. Halteres ochraceous, fuscous towards the knob.

*Length*—of ♂ 5 to 5.5 mm.; of ♀ 5 to 5.8 mm.

*Habitat*.—Australia generally. Skuse says widespread in Australia.

*Observations*.—This sub-species runs so closely into the type that I feel rather doubtful in separating it. All the specimens

I have examined differ in some minor points from Skuse's description, namely (i) the proboscis is testaceous at the tip, (ii) there are three rows of bristles on the thorax, and (iii) the basal half of the second antennal joint cannot be said to be either whitish or yellowish. Skuse points out its variability, and says it is found in towns throughout the year, but is more numerous and causes most annoyance during the summer months. Dr. Bancroft sends numbers from Queensland, where it is evidently very common; it is also abundant in South Australia and New South Wales. According to Skuse, it follows the railways, gradually spreading as the lines proceed further and further up country. In fact, it offers a good example of the way in which the mosquito follows the advance of man.

CULEX PUNGENS. Wiedemann.

*C. fatigans*. Wiedemann (?).

(Auss. Zweiflügel. Ins. p. 9.)

"Ferruginous, with the abdomen fuscous and the incisurae yellowish. 2 to 2½ lines.

"Antennae, palpi and proboscis brownish-black, the proboscis yellowish below. Thorax reddish-brown, with two distinct yellowish lines; pleurae yellowish, passing into white behind; abdomen brown, with yellowish incisurae; the last two or three segments with yellowish stripes on both sides. Wings unspotted, with brown-scaled veins; halteres yellowish.

*Habitat*.—New Orleans."

NOTE.—The above is Wiedemann's description of *C. pungens*, which, I think, is evidently his previously described *C. fatigans*. In any case *C. fatigans* is the common American (both North and South) and West Indian species and general cosmopolitan insect. If the two are synonymous the name *pungens* has precedence, as that species is described just before *fatigans*.

121. CULEX LINEALIS. Skuse.

(Proc. Linn. Soc. N. S. Wales, p. 1747 (1896).)

"Thorax brown, with four distinct lines and dense lateral borders of golden scales, the spaces between being nearly bare; the two median lines are parallel in front, united near the middle, and separate and parallel again behind, the outer are parallel and near the lateral borders; the pleurae are brown, with a few white scales and a tuft of pale hairs under the wings; scutellum brown, with the median lines of scales



continued as a line on to it. Abdomen violet-black, with narrow ochraceous bands basally. Legs unbanded, femora and coxæ ochreous, the former dark at the apex and above, tibiae and tarsi dark violet; the first two tarsi dimly ochreous at the base; hind tibiae one-third longer than the metatarsi. First sub-marginal cell scarcely longer and considerably narrower than the second posterior cell; the basal joint of the brown antennae is dull red-brown, with yellow scales; proboscis and palpi deep black. Halteres ochreous."

*Length*.—5.08 mm.

*Habitat*.—Blue Mountains; Hexham and Wheeney Creek, N.S.W.

*Time of appearance*.—October to January.

*Observations*.—Described by Skuse from a ♀ specimen. No specimens have been received from Australia of this clearly distinct species.

## 122. CULEX PUSILLUS. Macquart.

(Dipt. Exot. 4th Supp. p. 9.)

Proboscis, face, palpi and frons black (mesothorax brown, pale ochraceous in front of the scutellum; scutellum pale ochraceous brown, the lateral lobes dark); metathorax of a pale yellow (in the old specimens dull ochraceous); abdomen brownish-black, with white incisions, which, however, are often but little distinct (when denuded, as in the specimens now, the abdomen is yellowish-brown). Legs pale yellow. Wings clear, with the base and external border yellowish (veins all yellowish; first sub-marginal cell decidedly longer but very little narrower than the second posterior cell, its base considerably nearer the base of the wing than that of the second posterior cell, its stem short, only about one-fourth the length of the cell, base of the cell level with the junction of the sub-costal and costal; stem of the posterior cell equal to about two-thirds the length of the cell; posterior cross-vein not quite its own length distant from the mid cross-vein, sloping towards the base of the wing; second long vein forming a distinct angle with the marginal transverse).

*Length*.—3 mm. (Macquart says  $1\frac{1}{2}$  lines).

*Habitat*.—Egypt, from M. Bigot.

NOTE.—I have examined the specimens (five) of this species in Bigot's collection, now in Mr. Verrall's possession. It is a small, rather thickly-built mosquito, quite distinct from any other I have seen, and cannot be confused with *C. pipiens*. The types

are in very bad condition, but I have been able to make out a few additional characters, which I append with Macquart's original description.

The probability is that the specimens I have seen in Bigot's collection are either Macquart's types or certainly the same lot as those from which Macquart drew up the short description. It is certainly distinct from *C. pipiens*, Linn., approaching more nearly *C. fatigans*, but, judging from its general thick appearance and the closeness of the posterior cross-vein to the mid cross-vein, distinct. I have seen no recent specimens. The only Egyptian species I have seen have been Dr. Keatinge's new *Anopheles* (*A. Pharoensis*), *Culex pipiens* and a *Culex fatigans*.

### 123. CULEX FUSCANUS. Wiedemann.

(Dipt. Exot. p. 9, Wied.; Proc. Linn. Soc. i. pp. 4 and 105 (1857), Walker.)

"Dusky; thorax faintly banded; abdomen banded grey. Length,  $3\frac{1}{2}$  lines, ♂ and ♀. Thorax dusky, with grey hairs (scales?), arranged in such a way that the ground colour appears as four linear stripes, or at least shows so in somewhat rubbed specimens; abdomen the same tint as the thorax, each segment with a grey apical band. Antennae dusky, palpi yellowish beneath, fuscous, with two white spots. Wings yellowish at the costa. Legs yellowish-fuscous.

*Habitat*.—East India; Malacca, Singapore, Sarawak (Wallace)."

NOTE.—I have not been able to identify this species satisfactorily. There are three specimens so named in the old British Museum collection, but obviously incorrectly.

### 124. CULEX BICOLOR. Meigen.

*C. marginalis*. Stephens (?).

(Syst. Besch. 1 (1818).)

"Thorax with dorsum grey, with traces of darker longitudinal lines; pleurae speckled yellow. Abdomen dirty yellow, coxae yellow, tibiae darker yellow, tarsi brown; palpi and antennae yellowish-brown.

*Length*.—7–8 mm."

A doubtful species, said to be somewhat less yellow than the following, and possibly described from an old specimen of the latter, although it is recorded by both Schiner from Austria and Gimmerthal from Russia and Stephens from England. Walker suggests it may be *lutescens*. All specimens I have seen so named have been worn *C. pipiens*, L.

## 125. CULEX LUTESCENS. Fabricius.

*C. flavescens.* Fabricius.*C. thoracicus.* Desvoidy.

(Syst. Ent. Flensburgi et Lipsiae (1775), et Ent. Syst. Hafniae (1792-94), Fabricius; Syst. Antl. (1805), Fabricius (= *flavescens*); Essai sur les Culic. Mem. Soc. d'Hist. Nat. iii. (1827), Desvoidy (= *thoracicus*).)

"A yellow species with brown tarsi; the thorax has a reddish tinge; the ♂ palpi are black or brown towards the end, and the antennae are brown ringed in the ♂; in the ♀ antennae and palpi are brown; the yellowish proboscis is also brown at the tip, and the wings are yellowish, especially along the costa, with pale veins; the tarsi are brown."

Meigen gives the length as 2½ lines.

NOTE.—I have a note on a specimen of this European species, but unfortunately the specimen has been attacked by mites and irreparably damaged. It was taken at Kingston-on-Thames in 1885. Both Stephens and Walker also record it from England, Meigen and Schiner from Germany, Gimmerthal from Russia, Fabricius from Scandinavia.

## 126. CULEX PALLENS. Coquillett.

(Proc. U. S. Nat. Mus. vol. xxi. p. 303 (1899).)

♀. Head yellowish-brown; palpi brown, the base yellow; proboscis yellow; antennae brown, the first joint and base of the second yellow. Thorax yellowish-brown, the sides, posterior end, metanotum, and pleura yellowish, the sparse hairs and tomentum yellow; scutellum whitish. Abdomen yellow, its sparse hairs and tomentum also yellow. Legs, including the coxae, yellow; front tarsal claws of an equal size and destitute of a tooth on the under side. Halteres yellow, the knobs brownish-yellow. Wings hyaline, strongly iridescent. Male differs from the female as follows: palpi yellow, mottled with brownish-yellow; second joint of antennae and apical portion of joints 3 to 13 silvery-white; outer claw of front tarsi much shorter than the inner one, each bearing a tooth on the under-side.

*Length*.—5 to 6 mm. Four ♀'s and six ♂'s (No. 640).

*Type*.—No. 3963, U.S.N.M.

*Habitat*.—Japan.

NOTE.—The position of this species is doubtful. (F. V. T.)

UNBANDED LEGGED SPECIES RECOGNISABLE ONLY FROM  
THE TYPES.

## CULEX LURIDUS. Doleschall.

(Natuurkundig. Tijdsch. voor Ned. Ind. D. xiv. p. 384.)

"Greyish-brown, abdomen greenish, with black scales; legs fuscous hoary, wings pellucid, with black veins. Length,  $2\frac{1}{2}$  lines. Smaller than *C. setulosus*, almost the same colour and markings. The abdomen is greenish-black, haired on the back with broad transverse stripes.

*Habitat*.—Middle Java (Gombong); during the dry season in houses."

## CULEX RUFINUS. Bigot.

(Exp. Scientif. d. l. Tunisie, Dipt. p. 7.)

"Pale fulvous; antennae brownish; thorax rufous above; scutellum paler, clear drab, abdominal segments fuscous, broadly banded with pale brown bands; wings very pale yellow. General colour pale yellow; tergum reddish, darker laterally.

*Habitat*.—Tunis, in May."

NOTE.—Probably a worn specimen. (F. V. T.)

## CULEX MOLESTUS. Wiedemann.

(Zweif. Ins. p. 544.)

"Reddish-brown, with black abdomen. Thorax deep red-brown; antennae and other appendages brown; abdomen black, wings with brown scales.

*Length*.— $1\frac{1}{2}$  lines.

*Habitat*.—Sumatra."

NOTE.—Described from a very defective specimen.

## CULEX OCHRIPIES. Macquart.

(Dipt. Exot. Supp. iv. p. 11.)

"Fuscous; ♂ palpi yellow, apex black, elongated; legs ochraceous.

*Length*.—3 lines ♀.

"Thorax and abdomen brown (denuded), proboscis yellow, brown at the apex; palpi of ♂ dilated at the end, longer than the proboscis by a third of its length, yellow, last joint black. Wings greyish, reddish on the outer border.

*Habitat*.—South America."

NOTE.—Arribalzaga makes no note of this species; it was evidently described from worn material. I cannot trace the

type. I do not think the species could be identified unless from the type. I expect it is either *C. flavipes* or *C. fatigans*.

**CULEX SICULUS.** R. Desvoidy (1827).

"Thorax pale brick-red, with grey hairs; abdomen more or less brownish-red, pale yellowish in the ♂, with a brown band on each segment; proboscis yellow, with the apex brown in the ♀; palpi and antennae brownish in the ♀; legs with the femora and tibiae pale yellow, the tarsi brown ringed, knees with a silvery spot.

*Length*.—of the ♂ 2½ lines, of the ♀ 3 lines.

*Habitat*.—Sicily."

**CULEX SETULOSUS.** Doleschall.

(Natuurkundig. Tijdsch. voor Ned. Ind. D. xiv. p. 384.)

"Pale fuscous, hairy, thorax slightly narrowed in front, thickly clothed with ash-grey hairs; abdomen paler, bristly; legs uniformly fuscous. Wings hyaline, scaly, with yellow veins.

*Length*.—2 lines.

*Habitat*.—Middle Java; during the dry season in houses, equally numerous and not less troublesome than *C. nero*."

**CULEX GENICULATUS.** Olivier (1791).

"Thorax cinereous, with two blackish lines near the middle line and two on the sides. Abdomen dorsally brown, with the borders of the segments whitish. Legs with the femora white below and at the base, tibiae and tarsi blackish. Proboscis black, antennae brown.

*Habitat*.—Paris (Olivier and R. Desvoidy)."

NOTE.—There has been no recent record of this doubtful species.

**CULEX CALCITRANS.** R. Desvoidy (1827).

(Essai sur les Culicides, Mém. Soc. d'Hist. Nat. de Paris (1827).)

"Thorax dorsally reddish, with three brown stripes and with the pleurae cinereous. Abdomen pale yellowish on the dorsum, incisurae marked with black. Legs yellowish, with the tarsi brownish.

*Length*.—3 lines."

NOTE.—I believe this is only a partly denuded ♀ *Culex pipiens*.

**CULEX RUBIDUS.** R. Desvoidy.

(Essai sur les Culicid. p. 404.)

"Antennae brownish; proboscis yellowish with brown apex; palpi yellowish-brown; thorax reddish with a black dorsal line; abdomen brownish, with triangular yellowish lateral spots; wings brownish-yellow with villous veins; hind tarsi with white cilia. Length  $4\frac{1}{2}$  lines (♀).

*Habitat*.—Carolina."

NOTE.—I have seen nothing answering to this, and Coquillett does not mention it.

**CULEX MERIDIONALIS.** Leach (1825).

(Zool. Journ. N. vii. Oct. 1825.)

"Head and thorax reddish-brown; legs greyish-brown; abdomen dorsally reddish-brown with lighter bands on the dorsum of each segment behind.

*Length*.—5 mm.

*Habitat*.—Nice."

NOTE.—Described by Leach in his paper "Description of thirteen species of *Formica* and three *Culex*, &c." (Z. J. vii. 1825). It is said by Leach to be common in Nice. It is probably only *Culex pipiens*.

**CULEX PALLIPES.** Macquart (1838).

*C. melanorhinus*. Giles (1900).

(Dipt. Exoti. p. 33, Macq.; Gnats or Mosq. p. 342, Giles (= *melanorhinus*).)

"Fuscous; thorax with rufous scales; the sides and pectus pale; wings with the first sub-marginal cell longer than the second posterior; proboscis black; abdomen brown, pale yellow ventrally; fore coxae and femora pale yellow; tibiae and tarsi brown; wings rather yellowish.

*Length*.— $1\frac{1}{2}$  lines.

*Habitat*.—Egypt."

NOTE.—I have been unable to trace this species. It has not occurred amongst the few Egyptian mosquitoes I have yet seen. Lieut.-Col. Giles renames it *Culex melanorhinus*, as the name *pallipes* had been used by Meigen previously.

## CULEX (JANTHINOSOMA) OBLITUS. Arribalzaga.

(Dipt. Argentina, p. 54.)

"♂. Hoary or dark cinereous, with scanty frosty cinereous scales.  
Length.—4.50 mm."

NOTE.—I cannot make much out of this species from Arribalzaga's description; he makes no note of the abdomen at all. It is placed by the describer near *J. discrucians*, Walker, in his new genus *Janthinosoma*. The ♂, from which the scanty description is compiled, came from Navarro in Argentina. Dr. Lutz has not met with it in South America.

## CULEX FILIPES. Walker.

(Proc. Linn. Soc. v. p. 229.)

"♀. Ferruginous; head and abdomen black; proboscis less than half the length of the body; legs blackish, very long; femora paler towards the base; wings cinereous, veins black, fringed.

Length.—2½ lines.

Habitat.—Dorey, New Guinea."

NOTE.—The description is inadequate, and the type in the old collection is so denuded and decayed as to be valueless.

## CULEX PINGUIS. Walker.

(Science Gossip, p. 79 (1867).)

"♀. Fawn-coloured, stoutly built; abdomen with golden-coloured pubescence. Legs stout, paler than the body, tarsi darker; radial and sub-apical veins with long forks, wings cinereous, veins tawny, slightly pilose.

Length.—3½ lines.

Habitat.—British Columbia."

NOTE.—I cannot find the type of this species.

GENUS 12.—**PANOPLITES.** nov. gen.

Palpi short in the ♀, long in the ♂, in the latter with hair tufts, four-jointed in the ♀ and ♂; in the ♀ the first joint is small, the third long, the fourth small and nipple-like. Head clothed with narrow curved and long upright forked scales; thorax with thin hair-like curved scales and numerous bristles; scutellum with similar squamae; abdomen with flat scales with very convex apices. The abdomen of the ♀ is usually blunt, and the penultimate segment may have a row of short thick spines. *Wings densely scaled along the veins with broad asymmetrical flat scales (Plate B) on each side of the veins only, no median scales,* and also in some cases with long lateral clavate scales; fork of the second posterior cell usually nearer the base of the wing than that of the first sub-marginal cell. Legs usually more or less mottled and banded with white; unguis of the ♀ equal and simple, of the ♂ unequal, the larger one toothed, the smaller simple (in *P. titillans*, Wlk.).

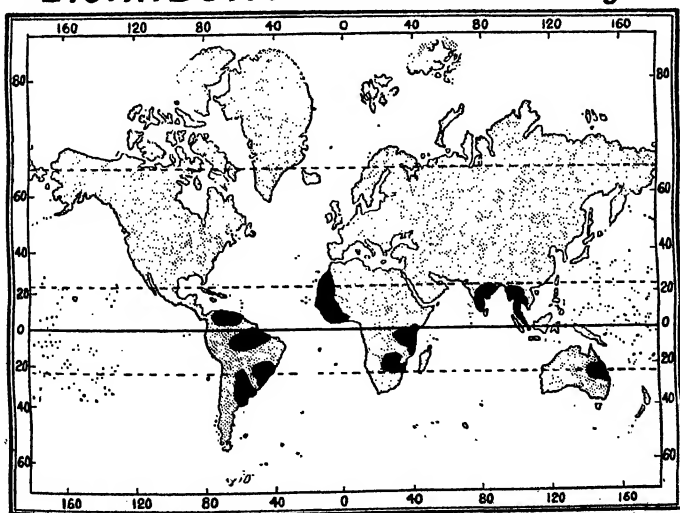
***DISTRIBUTION of PANOPLITES. n.g.***

Fig. 240.

Species of this genus, whose chief distinctive character is the presence of large scales on the veins of the wings, have been received from S. and N. America, West Indies, Australia, Africa,



and India. Three species at least occur in South America, two in Africa, two in India and two in the Malay Peninsula, one in the West Indies, and I have received a remnant from New South Wales.

There is a strong resemblance to *Aedeomyia* in this genus, the peculiar wing scales being very similar, making them difficult to identify unless a male specimen is obtainable. For that reason *P. annulifera* and *P. annulipes* may have to be removed to the latter genus, as I have been unable to obtain any ♂'s, but as they present such a striking resemblance to *P. titillans*, Wlk., and as two of the three have previously been described in the genus *Culex*, I think it safest to incorporate them here.

This genus seems to be chiefly confined to swamps and river courses, certain species, as *P. titillans*, following the tract of the large rivers of the country, although they are also found occurring on the littoral, in swamps and marshes. As far as I can gather, they are seldom found in houses, but some specimens have been received from the hospital and houses at New Amsterdam.

The bite of the *Panoplites* is very irritating, and the saliva in some species is distinctly acid (Dr. Lutz). They appear to be shade-loving species, and bite particularly at night.

I do not think any observations have been made on the larval or pupal stages. The eggs (Fig. 12) are laid singly, and differ in form to those of *Culex*. One of this genus is

the Filaria-bearing Mosquito on the Zambesi and Lake Nyassa (Daniels). Dr. Daniels has, I believe, experimented with this species and malaria, and finds in *P. Africanus*, mihi, that the malarial germs will not develop.

One species, *P. titillans*, Wlk., was placed by Arribalzaga in his genus *Taeniorhynchus*.

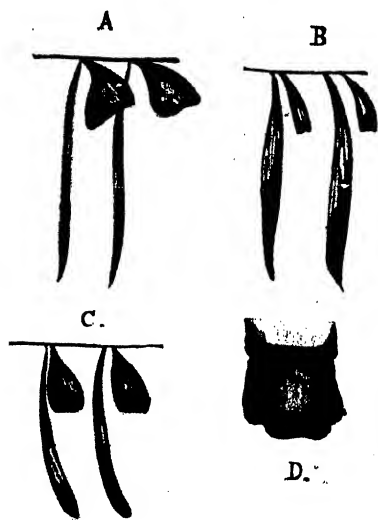


Fig. 241.

A, Border and fringe scales of *Panoplites annulifera*, Walker; B, of *P. annulipes*, Walker; C, of *P. titillans*, Walker; D, anal segment of *Panoplites*.

## SYNOPTIC TABLE OF SPECIES.

## A. Thorax unspotted.

Thorax uniformly dark brown, palpi and proboscis dark, the latter with a trace of banding ..... 1. *titillans*. Walker.

Thorax reddish-brown, with two median pale lines, small pale golden scales in the middle and round the front, abdomen with yellow apical bands ..... 2. *pseudotitillans*.  
n. sp.

Thorax chestnut-brown in the middle, paler at the sides, legs mottled and banded ..... 3. *uniformis*. n. sp.

Thorax dark brown, the front two-thirds of the mesonotum golden-brown scaled, tarsi banded white ..... 4. *Amazonensis*. n.sp.

## AA. Thorax spotted.

Legs all banded and mottled; yellowish-brown; wings with the posterior border with broad border-scales ..... 5. *annulifera*. n. sp.

Blackish-brown; wings with the border scales narrow ..... 6. *annulipes*. Walker.

AAA. Thorax ornamented with broad lines of golden-brown and silvery scales and two pale indistinct spots ..... 7. *Africanus*. n. sp.

1. *PANOPLITES TITILLANS*. Walker.

*Culex titillans*. Walker.

*Taeniorhynchus taeniorhynchus*. Arribalzaga.

(Fig. 117, Pl. XXX. and Pl. B.)

(Brit. Mus. List, p. 3 (= *Culex titillans*), Walker; Dipt. Argentina, p. 48 (Arribalzaga) (= *T. taeniorhynchus*).)

Thorax brown, with scattered brown curved scales and a few golden ones in lines; long black scales and bristles over the roots of the wings. Abdomen dusky brown, with yellow scales laterally, ochraceous ventrally, and sometimes with white scales on the apical borders, sides, and below. Legs yellowish-brown, clothed with ochraceous and dark scales, tarsi basally pale banded.

♀. Head brown, with grey scales and black upright forked ones; eyes black with narrow white borders; antennae dark brown with pale rings, basal joint very dark testaceous brown, a few dark scales on the first few joints; palpi yellowish, with

dark scales and a few white ones, apex white; proboscis yellowish-brown, a little dark at the base and very dark at the apex, in fact broadly pale banded in the middle (in some specimens only).

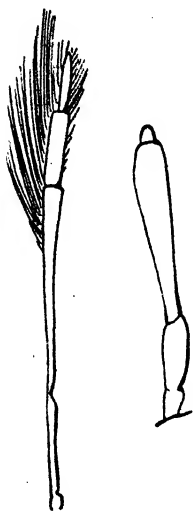


Fig. 242.

*Panoplitus titillans*, Wlk.  
Palpi of male and female.

Thorax brown, with scattered brown scales and a few golden ones, black hairs, and with long black curved scales at the sides in front of the wings, when denuded showing longitudinal markings; scutellum brown, with pale golden scales, dark at each side and in the centre, metanotum deep brown; pleurae brown and cinereous, with a few white scales.

Abdomen covered with dusky purplish-black and deep brown scales, and with yellow scales at the sides, when denuded yellowish-brown in the middle, darker towards the apex, segments bordered with golden-brown hairs, which are more dense at the sides and below; penultimate segment with a row of short black spines on the posterior border; laterally is present a line of black scales; venter ochraceous, with scattered dusky scales, especially towards the posterior borders.

Some specimens have white scales on the apical borders of the segments and at the sides and below, others have apical yellow-scaled bands.

Legs yellowish-brown, clothed with ochraceous and dark brown scales; femora and tibiae with darker scales, especially towards their apices; fore tibiae with ochraceous reflections, first three front tarsi basally pale, mid tarsi the same; hind tarsi all basally pale yellowish except the last; unguis equal, simple.



Fig. 243.

Wings with the posterior cross-vein about twice its own length distant from the mid cross-vein; border-scales white and dusky, rounded at the end (Fig. 241); first sub-marginal cell narrower than second posterior cell, their stems about as long as the cells; bases of the wings pale testaceous. Halteres pale, with dusky knobs.

Length.—5.5 mm.

♂. Palpi clothed with scattered white, brown, metallic purple and creamy scales, extremities white, penultimate joint with a dense tuft of deep brown hairs on one side, last joint also with long dark hairs, also a white band on the basal half; antennae dark yellowish-brown, with dark brown verticils. Abdomen apically banded with white scales, rest of the segments covered with brown scales, which are brilliant mauve in some lights; basal segment scantily scaled, with a central patch of white scales and with long chestnut-brown hairs, basal joints of genitalia with yellowish-brown scales, hairy laterally. Ungues of fore and mid legs unequal, the larger uniserrated.

*Length*.—5 mm.

*Habitat*.—Rio de Janeiro (Lutz) (4. 7. 1899, and Senhor Carlos Moreira) (9. 12. 1899), New Amsterdam, British Guiana (Rowland) (4. 4. 1899).

*Time of capture*.—In November in Brazil, according to Senhor Carlos Moreira; March in New Amsterdam (March 13).

*Observations*.—This is a fairly large and conspicuous mosquito, which seems to be common in South America. Dr. Lutz calls it the "River-Side" mosquito. Arribalzaga, in his work on Argentine Diptera, places this species in his new genus *Taeniorhynchus*, which I now retain for another of his species in the same genus, *T. fasciolatus* (Arri.). It is subject to considerable minute variation. Those sent by Moreira seemed to have the "border scales" very slightly more rounded at the apex than those sent by Dr. Lutz. Specimens received from New Amsterdam, sent by Dr. Rowland, have more white abdominal scales than the Brazilian specimens, but, on the other hand, they have none on the apex of the palpi. One specimen sent me by Dr. Lutz is quite black, with white scales.

This species can easily be told from other members of the genus, except *P. pseudotitillans*, by its larger size and by the absence of banding on the femora and tibiae. Some of the specimens sent from New Amsterdam were taken in houses. Dr. Lutz, however, writes me that "it seems limited to river sides and swamps fed by running water; it is generally abundant where it is found at all, bites also in the daytime, and its bite is one of the most painful. Its saliva is distinctly acid." In another letter he tells me it follows the course of the larger rivers of the interior, but it is also found in swamps along the littoral.

Arribalzaga says this species "is very variable in size and

colour. The specimens collected by Dr. Holmberg in Formosa are darker and smaller than his, and the rings on the tarsi are of a purer white. It inhabits the delta and banks of the Parana, and is present in great numbers in March and April, and visits the houses more than any other mosquito there; the bites of this mosquito are more painful than any other of the *Culicidae* I know. It is the 'black mosquito' which Holmberg refers to in his 'Voyage to the Mission.' Fortunately this insect does not live in the plains of the interior of Buenos Ayres districts, neither does it stray far from the banks of the Parana. It appears this insect does not like thickly populated places; at least it is rare in the city of Buenos Ayres and its suburbs."

*Synonymy*.—The species which Arribalzaga describes as *Taeniorhynchus taeniorhynchus* of Wiedemann is Walker's *Culex titillans*, described in the British Museum List, p. 5, 1848. The type of *C. titillans* is in the British Museum, and it is clearly the same as Arribalzaga's *T. taeniorhynchus*. In the same collection, arranged by Walker, was placed a specimen under the name *perturbans*, which is quite different; it is a *Taeniorhynchus*. Coquillett expressly states that his *taeniorhynchus* is not Arribalzaga's, but is also in error, for his specimens are Walker's *C. sollicitans*, judging from Professor Howard's excellent figure.

As far as one can tell from the short description, Wiedemann's *C. taeniorhynchus* is the one that occurs in South America and the southern half of North America, and is smaller and much darker as well as being more distinctly banded than *P. titillans*, whilst the scale structure is quite distinct. Walker's name *titillans* must therefore stand for this species.

## 2. PANOPLITES PSEUDOTITILLANS. n. sp.

Thorax reddish-brown, with two parallel median paler lines, darker brown between, with some pale golden scales in the middle and some pale scales around the front of the mesothorax. Abdomen fuscous, with yellow-scaled apical bands. Legs ochraceous, covered with brown and scattered ochraceous and white scales; tarsi and metatarsi with basal white bands on some or all of the joints; ungues equal and simple in the ♀. Wings densely scaled with broad flat squamae only, no long clavate scales, as in the former species, and generally more tawny in colour.

♀. Head brown, with narrow grey curved scales, broader white ones surrounding the eyes, and numerous very long black upright forked ones on the occiput; antennae black, with narrow white bands, basal joint dark brown, first few joints with black scales; palpi mottled with brown and creamy scales; proboscis ochraceous, densely scaled with large flat scales, dark near the base, with a few scattered grey scales, more or less bright ochraceous in the middle, and a few dusky ones at the tip.

Thorax bright reddish-brown, with two median paler reddish-brown parallel lines on the mesonotum, somewhat darker between than the rest of the thorax; there are a few dusky narrow curved scales, especially posteriorly, following the three parallel lines of long black bristles, the median of which ends in a bare space in front of the scutellum; there are also numerous long black lateral bristles, which are especially thick over the roots of the wings; along the dusky middle line, in front, on each side of the scutellum, and over the roots of the wings are a few golden curved scales, which form more or less a spot in front of the bare space before the scutellum and also on each side of the mesonotum; scutellum dusky brown, with narrow pale golden curved scales and long rich brown border-bristles; metanotum deep brown; pleurae brown, apparently unspotted.

Abdomen covered with deep brown scales, each segment with an apical border of yellow scales and with pale grey or pale yellow scales laterally; each segment with a row of posterior golden-brown border-bristles; the first segment ochraceous, densely hairy, with yellow scales; apical segment deep ochraceous, with dark scales and a border of small black bristles, like the former species; venter with scattered white and creamy scales.

Legs ochraceous, covered with dark brown and creamy-yellow scales; venter of the femora almost white, knee spot creamy; metatarsi and first two tarsi of the fore legs with white basal spots on the upper surface, in the middle legs on the first three tarsals, and in the hind on all the tarsi; these are true basal spots, not bands; ungues all equal and simple.

Wings with the veins entirely covered with broad dusky and yellow squamae only, of a general yellowish tint; posterior border scales mostly black, a few are white, small, and rounded at the apex; first sub-marginal cell a little longer and narrower than the second posterior cell, its base about level with the base of the latter, its stem rather less than half the length of the cell; stem of the second posterior cell also about half the length of the

cell; posterior cross-vein about its own length distant from the mid cross-vein.

Halteres with an ochraceous stem and fuscous knob.

Length.—6 mm.

Habitat.—Lower Amazons (Austen).

Time of capture.—March.

Observations.—Described from three ♀'s. Very like *P. titillans*, Walker, but of a more yellowish-brown tint and slightly larger. The chief difference, however, which is certainly specific, is in the scale ornamentation of the wings. In *P. titillans* there are numerous lateral scales on the veins of an elongated form, similar to those of a *Taeniorhynchus*, whilst in this species the scales are all typical *Panoplites* scales.

### 3. PANOPLITES UNIFORMIS. n. sp.

(Fig. 118, Pl. XXX.)

Palpi yellow scaled; proboscis yellow, with a broad black band near the apex and black scales at the base. Thorax brown, with chestnut and golden-brown scales in the centre, paler ones at the sides, forming pale areas at the sides of the central chestnut-brown portion. Abdomen brown, with yellow and white lateral patches and a few ochraceous patches on the dorsum; venter white and ochraceous. Legs with the femora and tibiae mottled and banded, metatarsi with basal and mid pale bands, tarsi basally banded white.

♀. Head purplish-brown, with curved white scales and black upright forked ones, slightly ochraceous at the sides; eyes purple and white, with a border of white scales; antennae brown, basal joint bright yellowish, and also the base of the next joint, remainder faintly banded; palpi yellowish, with a few blackish scales; proboscis ochraceous, with a broad black band near the apex, tip yellowish, and a few black scales at the base.

Thorax brown, with a purplish-brown tinge, covered with golden-brown scales in the centre, more or less arranged in rows, on each side a broad stripe of whitish scales, a patch of similarly coloured ones posteriorly; sides of the mesonotum with golden scales, and on each side, towards the scutellum, a large roundish bare dark spot (this does not always appear prominently); scutellum chestnut-brown with purplish-brown reflections, with

scattered white scales and a border of bright brown bristles, seven bristles on the mid lobe and five on each side; metanotum brown; pleurae with two patches of white scales.

Abdomen covered with dark purplish-brown scales, with patches of white and yellow scales laterally, the white on the posterior border of the segments; a few ochraceous patches on the dorsum; posterior borders paler, with golden hairs, the last few segments when denuded testaceous; venter with white and ochraceous scales on a dark ground.

Legs with the femora yellowish, mottled with dark scales and patches of white, no distinct banding; anterior tibiae dark in front, with about seven white spots; posterior tibiae with five white and six dark bars in front, yellowish beneath; metatarsi of all the legs pale at the base and banded white in the middle; the first two tarsal joints of the fore and mid legs basally white; all basally banded in the hind legs; unguis simple.

Wings mottled with dusky and pale creamy broad scales; posterior border with dark and light basal scales; border scales small; fringe dark; posterior cross-vein about twice its own length distant from the mid cross-vein; the base of the fork of the second posterior cell slightly nearer the base of the wing than that of the first sub-marginal; the cells of about equal width, the latter slightly the longer. Halteres with a pale stem and dark knob.

*Length*.—4.5 to 5 mm.

*Habitat*.—Quilon, Travancore, S. India (S. P. James) (7. 4. 1900); Taiping, Perak (Wray) (22. 11. and 21. 12. 1899).

*Date of capture*.—In S. India, February (James, February 8).

*Observations*.—Very like *P. annulifera*, but has no white thoracic spots and is slightly darker in colour. The "border scales" are not large and spatulate as in *P. annulifera*, but are both dusky and white typical *Culex* scales. The thoracic ornamentation should easily identify this species. Specimens of what are undoubtedly this insect were sent by Mr. Wray from Perak, a few minor differences, none of them structural, being due, I fancy, to the Perak specimens being in better condition. In the latter the white scales pass over the oval bare purplish spots seen in the Quilon specimens, and some of the white scales pass into middle golden-brown ones. The abdomen does not show so plainly the pale lateral scales, and is covered at the apex with yellow scales, which have probably been worn off in the Quilon specimens. The white scales appear very distinctly at the sides



of the posterior borders; the chief difference is, however, that the venter is densely yellow scaled.

This species also resembles *P. titillans*, but it is smaller, and has the femora and tibiae spotted and barred with white, the palpi much yellower, and the border scales small, not large as in *P. titillans*.

In some specimens received from Quilon from Captain James since the above description was compiled the two bare thoracic spots are absent, and there is seen to be more or less variation in colour in the specimens.

#### 4. *PANOPLITES AMAZONENSIS*. n. sp.

Thorax dark brown, the front of the mesonotum covered with bright golden-brown scales. Abdomen dark brown, unbanded, with yellow and grey scales on the lateral borders. Legs brown, bases of the tarsi (and metatarsi of the hind legs) basally pale banded, yellow on the fore and mid, white on the hind legs; unguis equal and simple.

♀. Head black, with a few dull golden curved scales, a small white patch on each side, a pale border to the eyes and numerous black upright forked scales; palpi rather long, covered with loose black scales, with a few grey ones dotted about; proboscis brown, with a small median white band and with yellow scales dotted over the basal half; antennae black, with narrow clear white rings, basal joint black, with yellow scales, second joint black, with black scales.

Thorax dark brown, the front of the mesonotum with narrow curved hair-like golden-brown scales, which extend rather more than half across the mesonotum, the remainder with narrow curved black scales; over the roots of the wings are numerous long black bristles, and also along the sides of the mesonotum; there are also a few pale scales in front of the scutellum; scutellum dull brown, with dark lateral lobes, ornamented with narrow pale scales; metanotum deep chestnut-brown; pleurae brown, with frosty reflections, yellow scales, and black bristles.

Abdomen steely-black, covered with blackish-brown scales, sides with yellow scales, and the segments with apical white spots; first segment covered with ochraceous scales.

Legs deep ochraceous, covered with fuscous scales, the tarsi

basally pale banded; femora ochraceous, sparsely covered with fuscous scales, so that the ground colour shows through, and also with scattered ochraceous scales; tibiae and metatarsi dark brown, with scattered yellow scales; base of the fore metatarsi and first two tarsi white, last two black; in the mid legs the first three tarsi are basally white banded; in the hind the banding is much broader and whiter; fore and mid ungues equal and simple.

Wings densely covered with typical broad *Panoplites* scales, brown and creamy-yellow; border-scales clavate, dark brown and yellow; first sub-marginal cell longer and narrower than the second posterior cell, their bases nearly level; stem of the former about one-third the length of the cell; stem of the latter rather less than one-third of the length of the cell; posterior cross-vein covered in scales, more than twice its length distant from the mid cross-vein. Halteres with a pale stem and fuscous knob.

*Length*.—4·3 to 5 mm.

*Habitat*.—Lower Amazon (Austen) (9. 6. 1880).

*Time of capture*.—January.

*Observations*.—Described from a single female. The thoracic ornamentation is different to any other *Panoplites*. The dense bright golden-brown scaled anterior portion of the mesothorax and the unspotted legs and banded tarsi will at once serve to identify it from the other members of the genus.

##### 5. *PANOPLITES ANNULIFERA*. n. sp.

(Fig. 120, Pl. XXX.)

Thorax tawny yellow, with four snow-white round spots, with a dark line running backwards from the posterior border of the two anterior spots; an indistinct fifth white spot may also be present. Abdomen with white scales laterally, and forming bands across the segments, last three segments with many white scales. Legs yellowish-brown, all the joints with many white bands.

♀. Head clothed with brownish-golden scales and long golden-brown hairs; eyes black, with a silvery border; palpi yellowish-brown, with a few scattered dark brown scales; apex snow-white; antennae brown, with pale bands; proboscis yellowish-brown, dark at the apex and base.

Thorax clothed with bright tawny scales, with four distinct round snow-white spots with a dark stripe running backwards from the posterior of the anterior spots, ending between or just before the second pair, an indistinct fifth spot may also be present; metanotum dark brown; pleuræ with a patch of white scales beneath the roots of the wings.

Abdomen fuscous, with paler apical borders, marked laterally with white scales, which extend more or less as bands across the abdomen, last three segments with many white scales; each segment has also a border of bristles, and is laterally as well as basally darker when denuded; venter with numerous white scales.

Wings clothed with very broad dark brown and pale scales along the veins, giving them a somewhat mottled appearance; border of the wings with similar broad scales as well as narrower ones and the long fringe. Halteres with the stem pale and the knob large and dark, cup-shaped.



Fig. 244.

Wing of *Panoplitus annulifer* (♀). (X. 9.)

Legs all banded for their entire length; anterior femora yellowish-brown, with a few scattered black scales, with five more or less distinct white bands; tibiae with four white bands, the black scales being more abundant, giving the dark bands almost a black appearance; metatarsi banded in the middle, first and second tarsi basally banded white, last two joints not banded, covered with dark scales; mid femora darker, with only two or three pale (not white) indistinct bands; tibiae with five white bands; metatarsi banded with white at the base and middle; first and second tarsal joints basally white, last two unbanded, darker; hind legs with the femora with five white bands and white apex, tibiae with four white bands, metatarsi with basal and middle bands and all the tarsi basally white.

*Length*.—4 to 4.5 mm.

*Habitat*.—Madras (Goodrich) (12. 12. 1899); Quilon, Travancore (James); Behar, Bengal.

*Observations*.—This species is quite distinct from *C. annulipes* of Walker, being much paler, of a more uniform yellowish-brown appearance to the naked eye, and may be distinguished from others of this genus by the spots on the thorax. Walker's type in the British Museum is still in fair condition, and is named *C. annulipes*. It is subject to some variation in size and colour, but never becomes the dark hue of the following species.

6. *PANOPLITES ANNULIPES*. Walker.*Culex annulipes*. Walker.*Culex dives*. Schiner.*Culex nero*. Doleschall (?).

(Fig. 119, Pl. XXX.)

(Reise der Novara, p. 31, Schiner; Natuurkundig. Tijdsch. v. Ned. Ind. xiv. 383 (= *nero*), Doleschall? Proc. Lin. Soc. Lond. i. p. 5 (1857), Walker.)

Thorax very dark brown, with dark coppery scales, with six bright greenish-white spots. Abdomen blackish, the antepenultimate and penultimate segments with white-scaled lateral patches. Legs long, black, banded white, including the femora and tibiae.

♀. Head blackish, with long black forked scales, with some scattered white ones, and with ten long bristles projecting in front; eyes brilliant purple and pale bronze towards the middle; antennae with basal joint dark, base of first to fourth joints banded white, remainder brownish-purple; palpi yellowish-brown, thickly scaled with dark scales near the apex and white ones at the extreme tip; proboscis with dusky purple scales at the base, then a yellow band, and then more dusky scales, whilst the tip is yellow scaled and has also some golden hairs.

Thorax dark brown, covered with very dark coppery-brown scales, a spot in the middle line and one on each side near the neck of pale greenish-white scales, another on each side a little way behind, and one in the middle of the thorax; scutellum densely whitish-green scaled in the middle, and with a small lateral patch of a similar colour; thoracic bristles large and brilliant, very pronounced on the scutellar edge; metanotum deep reddish-brown.

Abdomen covered with dense broad dark purplish-black scales; the segments with posterior borders of golden hairs, the two segments preceding the last with two patches of white scales on the sides; venter densely clothed with dark purplish-black scales, with a few white ones dotted about.

Legs long, especially the posterior pair, black, banded white; anterior femora with six distinct white bars outside, one complete band near the apex, knee yellow scaled; tibiae with

five white bands more or less complete and the apex white; metatarsi ringed in the middle, bases of the first and second tarsal joints white, third and fourth slightly paler, unbanded; femora of the mid legs with a complete white ring near the apex and bars as in the fore pair, apex pure white; tibiae with three distinct rings and other white patches beneath, not forming complete rings, apex faintly white; metatarsi banded in the middle; tarsi as in the fore leg; hind femora with a white ring near the apex and five white bars on the outside, indistinct on the inside; tibiae with two indistinct and two distinct white bands, metatarsi white at the base and in the middle, all the tarsal joints basally white ringed; unguis equal and simple, rather straight.

Wings with the posterior border without the large scales seen in *P. annulifera* (Fig. 241). Halteres with pale stems and large dusky knobs.

*Length*.—3·8 to 4·5 mm. (♀).

*Habitat*.—Selangor, Straits Settlements (A. L. Butler) (28. 10. 1899); Singapore (Walker); Batavia (Schiner).

*Time of capture*.—At Selangor, in September.

*Observations*.—This is a very common mosquito in the Straits Settlements, and is found chiefly in the jungles. It can easily be told by its dark colour, almost black to the naked eye, its spotted thorax and banded legs, which are very long, especially the hind pair. It can thus at once be separated from *P. annulifera*, with which it seems to have been confused.

*Synonyms*.—I think Schiner's species (*C. dives*), described from Batavia, is this insect. Doleschall in "Natuurkundig. Tijdsch. voor Neder. Indie," xiv. p. 383) describes a species under the name *C. nero*, which occurs in Middle Java, at Gombong. The description applies to this species, but as it is recorded as being "very numerous in dwelling houses and extremely troublesome" in Java, there is some doubt as to its being synonymous with *annulipes*, as the latter seems to be a jungle species in the Malay Peninsula.

The following is Doleschall's description of *C. nero* :—

"Black, with the eyes metallic green, wings with the veins black piloso-squamose, black along the anterior margin; legs bare, black, with white spotted joints. Length, 1½ lines.

"Black, with the eyes dark green. The antennae longer than the head and thorax in the ♂, thickly clothed with feathery hairs, the last joint out-turned. The proboscis rather long; palpi curved upwards and

outwards, clothed with long hairs. Thorax elevated oval, black, with some dark stripes. Abdomen cylindrical, armed with long hairs on both sides. Legs moderately long, as slender as hairs, black, hairless, with a white ring on each joint. Wings as long as the abdomen, scaly, black along the anterior border."

With the exception of not mentioning the white spotted thorax, the above description will be seen to apply fairly well to the *C. annulipes* of Walker.

#### 7. PANOPLITES AFRICANUS. n. sp.

Proboscis with median broad and narrow apical yellow bands. Thorax dark brown, ornamented with narrow golden-brown and silvery scales, the silvery ones forming more or less two spots on the mesonotum and occurring on each side of the posterior half of the thorax. Abdomen dark brown, the basal segments with basal median yellow spots, the apical segments with yellow apical bands; there are also white apical lateral spots; venter pale, with creamy scales, apex often mostly white scaled. Legs dark brown, banded and mottled with white. Wings with black and yellow scales.

♀. Head brown, with narrow curved grey scales and flat white ones at the sides, a white border round the eyes and numerous long upright forked dark brown scales; proboscis dark brown to almost black, with a broad median yellow band and a yellow band at the apex; palpi covered with dark brown scales, apex white scaled, and there is also a band towards the base; antennae brown, broadly banded with grey, the grey bands involving the base and apex of contiguous joints; basal joint testaceous, second joint pale testaceous, with a few black scales; clypeus deep testaceous.

Thorax deep brown (when denuded showing two parallel median grey lines), covered fairly thickly with narrow curved hair-like golden-brown and silvery scales, arranged as follows: a broad median band of golden-brown scales, which extends back to the bare space in front of the scutellum, and which then sends a branch down on each side of the clear space; there is also a patch on each side of the mesonotum in front of the wings, apparently more or less connected with the median golden-brown area by a narrow band of similar scales extending to the front of the mesonotum; the white scales occur in front and on each side

of the golden-brown areas, and form two more or less distinct spots on the anterior third of the mesonotum, and also flank the bare space in front of the scutellum between it and the fork of golden-brown scales; scutellum bright brown, with narrow curved white scales, the bristles arising from black spots, there being six median golden-brown bristles; metanotum deep brown; pleurae brown, with dark patches and white scales.

Abdomen dusky brown, covered with deep brown scales, the first segment with a large median patch of yellow scales, the second and third with basal creamy-yellow patches, the rest with more or less apical yellow bands, but the last three segments have dull ochraceous scales scattered over at least their basal half, whilst the apical one has many white scales; the segments have also lateral apical pure white patches, posterior borders of the segments with short brown hairs; venter densely covered with pale ochraceous scales.

Legs dark brown, with bands and mottlings of white, ochraceous when denuded; femora with two pale bands, the one near the apex white; tibiae with irregular black and white scaled patches; metatarsi pale at the base and with a white band in the middle, first two tarsi of the fore legs with basal white bands, the first three in the mid legs and all in the hind legs; unguis equal and simple.

Wings mottled, with brown and yellow scales; veins yellowish, a few long scales on the first long vein only; border scales small, rather long, flat or slightly convex at the apex, dark brown and yellow; first sub-marginal cell longer and narrower than the second posterior cell, its base about level with that of the other fork-cell, about one and a half times as long as its stem; stem of the second posterior cell about half as long as the cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein. Halteres ochraceous, with a slightly fuscous knob.

*Length.*—4 to 4·3 mm.

*Habitat.*—Fort Johnstone, British Central Africa; Chiromo, Lower Shire, British Central Africa (Gray); Lagos (Strachan) (91); also British Central Africa (Daniels) (b); Old Calabar (Annett).

*Time of capture.*—March (Fort Johnstone); June (Lower Shire); March (Lagos).

*Observations.*—This species is subject to considerable colour variation in regard to the abdomen; some show the white lateral

spots very clearly, others scarcely at all, in some the apex of the abdomen is mostly white scaled.

One specimen from Zomba (B.C.A.) differs so much in thoracic ornamentation that I describe it as a distinct variety. This *Panoplites* is evidently widely distributed over the West Coast and centre of Africa. Dr. Daniels has found it to be the *Filaria*-bearing species on the Zambesi and Lake Nyassa.

Var. A, *reversus*.

Thorax ornamented as follows: silvery scales in the middle, a broad golden-brown scaled line on each side, extending down to the bare space in front of the scutellum, then pale creamy scales forming another lateral broad line, and then more lateral golden-brown scales; the six median golden-brown border-bristles of the scutellum are arranged in two patches, three on each side. The posterior cross-vein is quite three times its own length distant from the mid cross-vein.

*Length*.—4.5 mm.

*Habitat*.—British Central Africa, Zomba (Gray) (83).

*Time of capture*.—June.

*Observations*.—A single ♀, sent by Dr. Gray, differs in the above respects from the type. As it occurs in the same locality and presents such a marked resemblance to *P. Africanus*, I think it can only be treated as a variety of that species, the only real structural difference being the greater distance of the posterior cross-vein from the mid cross-vein. The scale ornamentation of the thorax is just the same in arrangement, only the colours are reversed.

The remnant of a specimen of this genus has been sent from Queensland by Dr. Bancroft (25. 5. 99).



GENUS 13.—**TAENIORHYNCHUS.** Arribalzaga.

(Modified, F. V. T.)

(Dipt. Argentina, p. 47 (1899).)

Palpi long in the ♂, short in the ♀; the fifth joint in the ♀ minute, buried in scales; ♂ palpi longer than the proboscis, third joint long; head clothed with narrow curved scales and upright forked ones; thorax and scutellum with narrow curved scales; abdomen with flat scales; wings clothed with thick elongated scales, ending either diagonally and convexly, or more or less bluntly pointed (Plate E, and Fig. 245), median linear scales to the veins often absent; legs usually spotted or banded; unguis of female equal and simple, of the male unequal in the fore and mid legs, the larger one with one or two teeth, the smaller simple, the hind claws also simple; wings with similar venation to *Culex*. The proboscis is usually banded.



Fig. 245.  
Wing scales of  
*Taeniorhynchus*.

I have retained one of Arribalzaga's species in his genus *Taeniorhynchus*, but have modified the characters of the genus, the essential character being the form of the wing scales, as seen in his *T. fasciolatus*, which is quite distinct from his *T. taeniorhynchus*, the *C. titillans* of Walker. Ficalbi's *Culex Richardii* comes in this genus, in spite of the male unguis differing from those of Arribalzaga's species.

Walker's *Culex perturbans* also comes in this genus, and numerous other species mentioned in the following pages. They all seem to be sylvan insects, and can at once be told by the densely scaled wings, the scales being comparatively thick. Nothing is known regarding the ova, larvae, or pupae of any species in this genus. There are two main groups in the genus, (i) brown species, (ii) yellow, metallic purple and orange species.

## SYNOPTIC TABLE OF TAENIORHYNCHUS.

## A. Brown species.

## a. Thorax ornamented.

## β. Legs banded.

Thorax with median paler line covered  
with golden scales, and two pale scaled  
lines in front and behind ..... *fasciolatus*.    Arribalzaga.

Thorax chestnut-brown with small golden scales; abdomen dusky yellowish-brown, with scattered yellow scales and pale lateral spots ..... *Richardii*. Ficalbi.

Thorax dark brown, with pale golden scales on the front two-thirds, black on the remainder ..... *tenax*. n. sp.

Thorax brown with golden scales, white over roots of wings and a pale line on each side of bare space in front of scutellum; pale abdominal bands apical ..... *ager*. n. sp.

Thorax chestnut-brown with very small narrow brown scales in the middle, paler ones at the sides; pale central line to the scutellum; abdomen with basal pale bands ..... *perturbans*. Walker.

#### AA. Yellow and orange and purple species.

##### a. Legs banded.

Thorax yellow, with four purple marks on each side; abdomen yellow, with metallic purple apical bands to second to fifth segments; unguis of ♀ equal and simple; of ♂ unequal, uniserrated ..... *conopas*. Frauenfeld.

Thorax brown with creamy-yellow scales, a brown patch on each side in front; abdomen yellow, dark apical bands ... *Annettii*. n. sp.

Thorax clear yellowish-brown in front, with narrow yellow curved scales in mid line, darker behind; abdomen ochraceous yellow; ♀ tarsi with broad brown apical bands ..... *fulvus*. Wiedemann  
= *flavicosta*.  
Walker.

Thorax golden-yellow; abdomen golden-yellow; hind tarsi dark ..... *aurites*. n. sp.

##### aa. Legs unbanded.

Thorax golden-yellow, metallic in front; abdomen orange-yellow, first four segments apically purple ..... *acer*. Walker.

Thorax bright ochraceous with two deep purplish patches behind; fork-cells short; abdomen purple with ochraceous basal bands ..... *brevicellulus*. n. sp.

1. *TAENIORHYNCHUS FASCIOLATUS*. Arribalzaga.

(Rev. d. Mus. d. l. Plata, p. 50.)

(Fig. 121, Pl. XXXI.)

Thorax dark brown, with a broad median paler line covered with golden scales, with two pale-scaled lines in front and two behind. Abdomen dusky black and brown, with six lateral patches of white scales; venter with yellowish scales and brown bands. Legs with basal white bands to metatarsi and tarsi; apical to the femora and tibiae, the femora with a white band near the apex.

♀. Head dark brown, with white curved scales dotted about and black upright forked ones, a narrow pale border round the eyes, white curved scales at the sides of the head; eyes black; antennae deep brown, faintly pale banded, basal joint and base of the second joint testaceous; palpi with black scales at the top of the joints, brown at their bases, the apical joint white scaled, five-jointed; proboscis dark, almost black, with a broad creamy-white band in the middle and with the apex pale.

Thorax dark brown, with a broad median testaceous line covered with scattered curved golden scales, which forks about halfway across the mesonotum, and which become paler near the scutellum; also a curved line of pale scales on each side in front, and another on each side behind, over the roots of the wings; there are also dense fuscous bristles over the roots of the wings; scutellum with curved pale golden scales and dark brown border-bristles; metanotum brown; pleurae brown, with a greyish-sheen and white patch of scales.

Abdomen dark steel-blue, almost black, and ochraceous, covered with dusky black and brown scales, with six lateral patches of white scales; posterior borders of the segments with golden hairs, very long on the first segment, which is dark, with dusky black scales; venter with yellowish scales and indistinct bands of dark brown.

Legs with the femora white beneath towards the base, yellowish above near the base, speckled with dark brown scales, which become densely packed towards the apex, which is almost black; on the dark apical end is a pure white band; knee spot white; tibiae dark blackish-brown, with silvery

specks, apex white; the apical tibial spot joins with a basal white spot on the metatarsi to form one spot, apex of metatarsi also white; first fore tarsal joint pale at both ends, base of the second also pale, the rest brown; mid tarsi the same, but the banding more distinct; in the hind legs the tarsal banding is continued on to the base of the last tarsal joint; hind metatarsus a little shorter than the hind tibia; unguis equal and simple, hind ones very thin.

Wings with the veins densely clothed with fuscous scales, rather broad and long and convex or flat apically; first posterior cell longer and narrower than the second posterior cell, stem of the former equal to about half the length of the cell; stem of the second posterior cell equal to the length of the cell; posterior cross-vein rather more than its own length distant from the mid cross-vein; fringe brown; halteres pale yellowish.

*Length*.—5 mm.

♂. Head dusky brown, with narrow curved pale golden scales, which form a distinct white border round the eyes, numerous black upright forked scales and a small tuft of golden bristles projecting forwards; proboscis dark brown, with a median pale yellow band, and traces of another at the apex; palpi brown, the two apical joints with basal white bands, a third band near the base, hair-tufts on the penultimate joint strong, brown inside, golden-yellow outside; antennae grey, banded with bright brown, plumes flaxen.

Thorax reddish-brown, with pale golden scattered scales forming a median area, arranged in lines, then broad bare lines, and then pale golden, almost silvery scales at the sides, especially over the roots of the wings; scutellum reddish-brown, with narrow pale curved scales, lateral lobes dark; border-bristles golden-brown, five to the mid lobe; metanotum chestnut-brown; pleurae chestnut-brown, with dark patches and flat black scales.

Abdomen fuscous, covered with dusky brownish-black scales, bases of the segments somewhat paler, and with white basal lateral spots; posterior border-bristles small, golden-brown.

Legs as in the ♀; fore and mid unguis unequal, the larger with one tooth.

*Length*.—5 mm.

*Habitat*.—Rio de Janeiro (Carlos Moreira) (12. 12. 1899); Navarro, in Argentina (Arribalzaga); Lower Amazon (Austen); Sao Paulo (Lutz).

*Time of capture*.—November (C. Moreira).

*Observations.*—A single ♀, sent by Senhor Carlos Moreira, of this species, differs from the type in having the leg banding involving both sides of the tarsal joints. Arribalzaga's figure of this species gives a broad yellow band down the middle of the mesonotum. This band is in reality a broad testaceous stripe, with golden curved scales. The coxae are also brown in the Rio specimen, not reddish, but, beyond these minor differences, the specimen answers exactly to Arribalzaga's description and figure. Another lot I find from the Lower Amazon, including a ♂. These are for the most part rather browner than the one from Rio, but answer in all other respects. Dr. Lutz also sends me specimens from Sao Paulo.

Dr. Lutz writes me concerning this species as follows: "It is a real swamp mosquito, common in the littoral; stings painfully, in preference through the stockings, principally at dusk, or in the shade during the daytime. I have it from Rio, Sao Paulo, and Santos."

## 2. TAENIORHYNCHUS RICHARDII. Ficalbi.

*Culex Richardii.* Ficalbi.

(Bull. Soc. Ent. Ital. p. 261 (1896).)

(Fig. 122, Pl. XXXI.)

Thorax bright chestnut-brown, with small golden scales; abdomen unbanded, dusky yellowish-black, with scattered yellowish scales and five or six pale lateral spots; legs with metatarsi and tarsi basally pale banded; metatarsi also banded in the middle; female unguis equal and simple; male unguis of fore and mid legs unequal, the large biserrated, the smaller simple hind equal and simple.

♀. Head brown, with narrow curved very pale creamy scales, which become almost white at the sides of the head, and with ochraceous and black upright forked ones; antennae brown, with narrow pale rings, basal joint bright, pale ferruginous, also the base of the second joint; palpi yellowish-brown, evidently covered with dark brownish scales (Ficalbi says black, chequered with dull yellow); clypeus deep ferruginous-yellow; proboscis dull yellow, with scattered black scales, which almost cover it at the apex.

Thorax bright chestnut-brown, with scattered golden scales, somewhat paler in front, and more or less distributed in rows:

bristles black; scutellum pale yellowish-brown, with a few scattered pale, narrow curved scales and bright golden-brown border-bristles; metanotum clear ochraceous-brown; pleurae pale yellowish-brown, with a few pale yellowish scales.

Abdomen, when denuded, dull ochraceous-brown in some lights, dark shiny black in others; covered with dusky scales, almost black, with a few dull yellowish ones here and there, and with five or six yellowish-white lateral spots in the last five or six segments. (Ficalbi describes the abdomen as black, with dull yellow specks and six bright yellowish trapezoidal spots along the sides.) Numerous golden-brown hairs along the sides and posterior borders.

Legs with the coxae yellowish, with a few black scales; femora yellowish, with a few scattered black scales above, forming a deep black band round the apex, which is white, the white band not involving the tibia; tibia yellowish, with

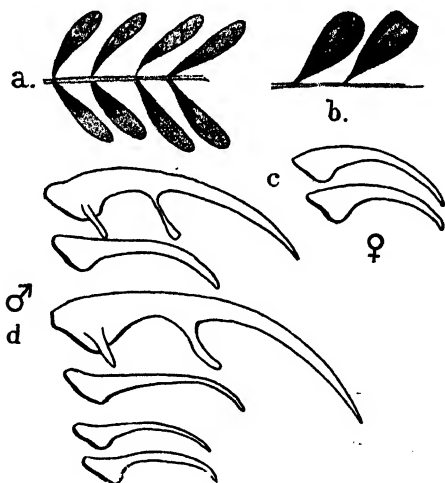


Fig. 246.

*Taeniorhynchus Richardii*, Ficalbi.a and b, Wing scales; c, fore unguis of the ♀;  
d, unguis of the ♂.

scattered black scales and some dull yellow ones, metatarsi and tarsi somewhat darker scaled, banded as follows: fore metatarsi and first two tarsi with traces of basal banding; in the mid legs the bands are more distinct, and with a trace in the middle of the metatarsi and on the base of the third tarsal; hind

legs with the bands still more distinct and broader, and with a broad, pale, median metatarsal band; unguis equal and simple.

Wings with the veins densely clothed with rather broad, elongated oval, brown scales and with a few scattered yellow ones, especially along the costal region; no long, thin, lateral scales; first sub-marginal cell a little longer and narrower than the second posterior cell, stem of the former about two-thirds of the length of the cell; of the latter also about the same relative length; posterior cross-vein more than two and a half times its own length distant from the mid cross-vein; halteres pale ochraceous.

*Length.*—7 to 10 mm.

♂. Head dark brown, with a narrow pale border to the eyes, pale curved scales and black upright forked ones behind and similar ochraceous ones in the middle (partly denuded); proboscis covered with ochraceous-brown scales in the middle, black at the apex, and dark scaled basally; palpi ochraceous-brown, black at the apices, with black hair-tufts, and a few patches of dark scales nearer the base; antennae banded with dense brown plumes.

Thorax, when denuded, chestnut-brown, with scattered pale golden scales, showing a thin, median, dark line and broader lateral pale longitudinal lines; scutellum with only a single row of posterior median bristles; metanotum chestnut-brown; pleurae chestnut-brown, with a few dark patches and white scales and pale hairs, which are particularly thick on the prothoracic lobes.

Abdomen steely-black, covered with deep dusky brownish-black scales, each segment rather ochraceous at the base, and with a few white scales, densely clothed with long golden-brown hairs.

Legs ochraceous, with scattered ochraceous, white and dark scales on the femora and tibiae, the latter dark towards the apices; metatarsi with a pale band in the middle and one at the base, tarsi all broadly basally pale-yellow banded, the third joint small, and with only a faint trace of basal banding, in the hind legs the basal banding is distinct on all the joints; unguis of the fore and mid legs unequal, the larger one with two teeth.

Wings with the veins covered with rather broad scales, mostly purplish-brown, but some white; first sub-marginal cell

a little longer and slightly narrower than the second posterior cell, its stem very nearly as long as the cell and about the same length as the stem of the second posterior cell; posterior cross-vein more than twice its own length distant from the mid cross-vein. Halteres pale ochraceous.

*Length*.—7 mm.

*Habitat*.—England, at Sutton (Bradley); Italy (Ficalbi); Toronto, Canada (E. M. Walker) (66).

*Time of capture*.—June, in England.

*Observations*.—Mr. Bradley sends me a single ♀, which answers in all ways to Ficalbi's species *C. Richardii*, although the abdomen is not black as Ficalbi describes, but dusky brown; the scales are rather denuded, however, which may account for

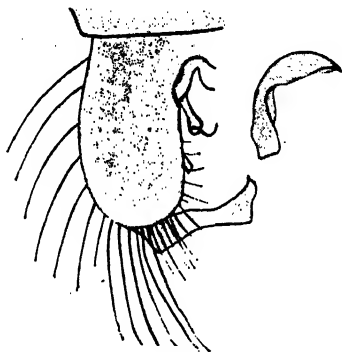


Fig. 247.

Male genitalia of *Taeniorhynchus Richardii*  
(after Ficalbi).

this discrepancy. There are scarcely any traces of mid banding to the fore metatarsi, but they may be detected by a few pale scales. Ficalbi states that the female bites man and animals, both in the daytime and at night, whilst the ♂ is harmless.

A single male sent by E. M. Walker from Canada is undoubtedly the ♂ of this species, answering in nearly every detail to Ficalbi's detailed description.

The wing scales are similar in form to those of *T. fasciolatus*, Arri., and as such are more consistent characters than the unguis I place *C. Richardii* in this genus.

As I have only received one ♂ from Canada I have been unable to examine the ♂ genitalia, but I feel confident without that final test that it is Ficalbi's species.



## 3. TAENIORHYNCHUS TENAX. n. sp.

(Fig. 65, Pl. XVII.)

Thorax dark brown, with pale golden scales on the front two-thirds of the mesonotum, gradually becoming paler behind and ending in an irregular line, remainder of the mesonotum black, with black curved scales and also two pale scaled lines ending at the junction of the pale and darker mesothoracic areas. Abdomen brown, with scattered yellow scales, especially on the apical segments, last two segments with a broad posterior band of orange scales, some segments with lateral patches of yellow scales. Legs dark scaled with a few scattered yellow ones; metatarsi and tarsi basally pale banded, the bands involving to some extent both sides of the joints.

♀. Head brown, with yellowish-brown scales in front and at the sides and a patch of black scales on each side of the back of the crown, eyes purple to black with white scales along their edges; antennae brown, with testaceous basal joints; proboscis black, with a broad pale band just past the middle of its length; palpi black, with white scales at the tip and black hairs.

Thorax dark brown, with pale golden curved scales in front, gradually becoming paler behind and ending in an irregular line about two-thirds of the way across the mesonotum, the rest of the mesonotum black, clothed with curved black scales and four rows of long thick black bristles; there are also short dark bristles on the front of the mesonotum, and also two lines of paler scales, somewhat converging backwards to the light scales forming the edge of the pale scaled area; scutellum brown, with black scales and long black bristles on the posterior border, darker on the middle and sides; metanotum brown; pleurae pale, with black bristles and a few white scales and pale hairs.

Abdomen covered with deep brown scales with a few scattered yellow ones, the posterior edges with a few yellow scales, except the last two segments, which have a broad posterior band of orange scales, the third to sixth segments with large lateral triangular patches of yellow scales, the penultimate segment with a W-shaped posterior border of the same colour; the first segment is pale ochraceous, with a few dark scales in the centre and three large tufts of long bristles; posterior borders of the segments and sides with long chestnut-brown hairs; there

are also collections of yellow scales basally ; venter covered with yellow scales.

Legs densely covered with black scales with a few scattered yellow ones ; knees yellowish ; fore tarsi, except the last, basally pale, the banding to some extent involving the apex of the preceding joint ; posterior metatarsi with dense brown hairs on the ventral aspect of their base ; mid and hind tarsi the same, the last tarsal joint paler than the rest.

Wings with the veins clothed with a double row of broad brown scales ; fringe dark brown ; first sub-marginal cell a little longer and very much narrower than the second posterior cell ; cross-veins nude.

*Length*.—6·5 to 7 mm.

*Habitat*.—Straits Settlements, Perak (Wray) (22. 11. and 21. 12. 1899).

*Observations*.—In old specimens the scales on the head are white. I have seen specimens from the west coast of Africa and Durban very like this species, but I find they are distinct—not even *Taeniorhynchi*, although the thoracic ornamentation is similar.

The curious arrangement of the thorax and the dense black bristles on its posterior half form characters by which this species can at once be identified even with a hand-lens.

I can find no banded-proboscis species previously described at all like this mosquito, which is a very characteristic form, and whose thoracic ornamentation will at once render its identity easy.

#### 4. TAENIORHYNCHUS AGER. Giles.

(Entomologist, p. 196, July, 1901.)

Thorax deep chestnut-brown, with scattered golden scales, almost white over the roots of the wings. Abdomen black, with apical creamy-white bands. Legs ochraceous, with black and white scales, giving them a mottled appearance ; tarsi basally pale banded on the fore legs, apically and basally on the mid and hind legs.

♂. Head covered with dull, pale creamy-white curved scales, with scattered brown, forked, upright ones behind, which are ochraceous at the tips, and flat white ones at the sides, forming a pale spot ; palpi dark brown, with the apical joint yellow, and ending in a brown spine, base of the next two joints banded

with yellow, the following with a broad and narrow paler yellow band, hairs almost black; proboscis dark brown, pale banded at the base of the apical half; antennae banded brown and white, plumes brown.

Thorax deep chestnut-brown, with scattered curved golden scales in front, becoming paler behind, and almost white over the roots of the wings, where they are somewhat longer, and form a

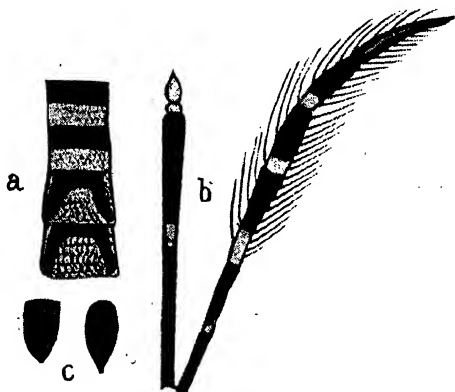


Fig. 248.

*Taeniorhynchus ager*. Giles (♂).

a, Abdominal ornamentation; b, ♂ palpus and proboscis; c, wing scales.

line on each side of the bare space in front of the scutellum; numerous black bristles over the root of wings, and a row on each side just in front of the scutellum, apparently not running as far as the middle of the mesonotum; scutellum brown, with numerous pale curved scales and dark border-bristles; metanotum chestnut-brown; pleurae pale ochraceous-brown, with a patch of pale scales.

Abdomen banded, basally with black scales, apically with creamy-white scales; the first three segments have the dark basal bands convex, but on the next three they are prolonged laterally and thus concave, last segment mostly black scaled, hairy, hairs golden-brown; venter pale scaled, some segments show a narrow dark basal band.

Legs deep ochraceous, covered with black and white scales, giving them a mottled appearance; tarsi basally banded; the first two on the fore legs only; the third joint very small, the fourth more than twice its length; fore ungues unequal, the larger one toothed; in the mid legs the metatarsus is basally

banded, and the three bands on the foot involve both sides of the joints; unguis as in fore legs; in the hind legs the banding is very similar, but there is a narrow basal band, in addition, to the last joint, and the unguis are small, equal, and simple.

Wings with the veins covered with rather broad, clavate, brown and creamy-grey scales; no long thin scales at all on the wings; first sub-marginal cell longer, but about the same width as the second posterior cell, its stem not quite as long as the cell; stem of second posterior cell equal to the length of the cell; posterior cross-vein about twice its own length distant from the mid cross-vein; fringe brown. Halteres with ochraceous stem and fuscous knob.

*Length*.—4.5 mm.; palpi, 3.3 mm.

*Habitat*.—Madras (Captain Cornwall); N. W. India (Giles).

*Time of appearance*.—December.

*Observations*.—Two ♂'s, taken by Captain Cornwall in paddy-fields. A very distinct banded-proboscis species, with the wings with rather thick clavate scales, giving them a somewhat mottled appearance; the broad apical pale bands to the abdomen at once separate it from the other *Taeniorhynchus*.

Lt.-Col. Giles has found the ♀ of this species in N. W. India, and has described it since this went to press.

##### 5. *TAENIORHYNCHUS PERTURBANS*. Walker.

(Ins. Saund. p. 428, pt. 1.)

Proboscis banded in the middle. Thorax brown, unornamented with narrow curved brownish scales, a few almost golden at the sides, and pale greyish-golden on the middle of the scutellum. Abdomen brown with pale basal bands. Legs deep brown, the tarsi with basal white bands, and the metatarsi and tibiae banded white.

♀. Head chestnut-brown with narrow curved silvery-grey scales, numerous long upright brown forked-scales, and a few golden bristles projecting between the eyes; antennae brown with ferruginous basal joint and with narrow pale bands; palpi brown with darker brown and a few scattered grey scales; proboscis deep brown with a median creamy-white band.

Thorax chestnut-brown with very small narrow brown scales in the middle, and some rather pale golden-grey ones at the sides;

with numerous brown bristles especially on the roots of the wings; scutellum brown with greyish-yellow narrow curved scales in the middle (forming a median line); metanotum deep chestnut-brown; pleurae brown. Abdomen brown, covered with brown scales, and with rather indistinct basal creamy bands and some traces of pale apical scales; venter brown with scattered grey scales.

Wings with the veins densely clothed with typical brown *Taeniorhynchus* scales; first sub-marginal cell longer and narrower than the second posterior cell; cross-veins hidden under scales.

Legs brown, banded femora with many white scales below, and scattered about above a dark ring near the apex, apex white; tibiae with more or less distinct bands, three deep brown, two white; metatarsi with a white band in the middle; tarsi of hind legs with basal white bands; those of fore and mid legs missing, femora hairy, rest of the legs more or less spiny. Ungues of hind legs equal, simple.

*Length*.—6.3 mm.

*Habitat*.—United States.

*Observations*.—Redescribed from Walker's type in the British Museum, which is in fair condition, but the fore and mid tarsi are lost. It is a distinct *Taeniorhynchus*, and can easily be told from all known brown species by the banded tibiae and tarsi.

## 6. TAENIORHYNCHUS CONOPAS. Frauenfeld.

(Verhand. Zool. Bot. Ges. Wien, xvii. 451 (1867).)

(Fig. 90, Pl. XXIII.)

Thorax golden-yellow with purple patches. Abdomen bright orange-yellow, apices of second to fifth segments metallic purple. Legs yellow, tarsi dark brown with pale basal bands; wings with a yellowish tinge.

♀. Head densely covered with curved golden-yellow scales and a very few brown upright forked ones; eyes black below, with silvery sheen above; palpi clothed with yellow scales and a few black hairs; antennae yellowish at the base, pale brownish towards apex, faintly pale banded; proboscis dark yellow, black at the apex.

Thorax golden-yellow, purple in front and at the sides, yellow

behind, the purple being dark towards the sides, where it forms four dark patches on each side, three rows of golden-yellow scales in front, the lateral ones bending round the front spots and also continued down to the scutellum, bristles chestnut-brown, long in front and at the sides; scutellum pale yellow in the middle, dark purple laterally, with four golden bristles to the median lobe; metanotum purplish-brown, paler in the middle; pleurae pale yellowish, with three black lines, the lower one on the coxae, these lines are really composed of three long spots each.

Abdomen bright orange-yellow, the apices of the second to fifth segments metallic purple, the first segment has a bunch of dark scales in the middle; ventrally the abdomen is yellow, with narrow apical dark bands, anal segments all yellow, pubescence yellow, very dense towards the apex of the abdomen.

Legs clothed with orange-yellow scales, with a few scattered black ones, especially prevalent on the tibiae and forming a black spot at the apex of all the joints in the fore limbs, indistinctly so in the mid limbs; in the hind legs the black scales form a broad band at the base and apex of the tibiae, and a broad black band at the apex of the metatarsi and tarsi. Ungues equal and simple.

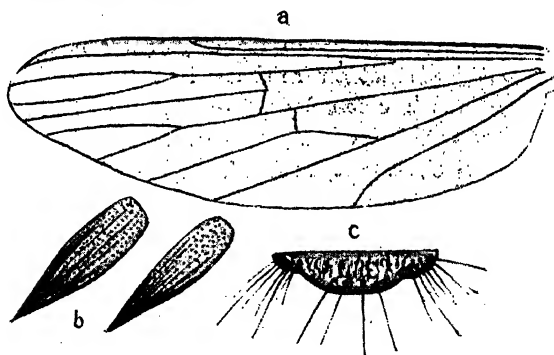


Fig. 249.

*Taeniorhynchus conopas*, Frau.

a, Wing of ♀ (X. 14); b, wing scales; c, scutellum.

Wings longer than the abdomen, with a yellowish tinge, particularly so along the costal region; veins yellow, clothed with pale fuscous yellow scales; there is a deep purple spot on the costa at the root of the wing; base of the second posterior cell very little nearer the base of the wing than that of the first

sub-marginal; stem of the first sub-marginal a little the longer, but not so long as the cell; stem of the second posterior short, not quite so long as the cell. Cross-veins faint, posterior nearly twice its own length distant from the mid. Scales all rather broad and flat. Halteres yellow, with a few dusky scales on the knob.

*Length*.—5 mm.

*Habitat*.—Straits Settlements, Perak (Wray (22. 11. and 21. 12. 1899); Selangor (A. L. Butler) (28. 10. 1899); Formosa (C. Ford) (8. 1. 1900).

*Time of capture*.—In Formosa, June (Ford).

*Observations*.—The female is a very distinct and beautiful form, yellow in colour, with purple thoracic spots and bands on the abdomen and with banded legs, differing from *T. acer*, Walker, from Queensland in many respects.

Specimens have been also sent by Mr. Butler from Klang Forest, Selangor, where it is fairly common. Although there is a difference in size, I feel sure this is Frauenfeld's *Culex conopas*. I have seen one or two specimens which, not being in good condition, answer exactly to his description, appended below. Frauenfeld described the species from a ♀ taken on board ship in the China Seas. It occurs right up the Malay Peninsula as far as Burma, and probably extends over China. A specimen in Bigot's collection under the name *C. flavidus* is undoubtedly this species, but I am not aware that Bigot described it. Some poor specimens, much eaten by mites, received from Formosa evidently belong to this species.

Description of *C. conopas*, Frauenfeld :—

"Impure ochraceous, the dorsum somewhat darker; thorax somewhat lighter behind and at the sides; eyes black. Antennae, palpi, and proboscis yellowish, the latter brown for its apical third; palpi also brown at the tip, and appear in some lights glistening brown; flagellar joints of the antennae with one or two bristles. Legs ochreous, with a silvery lustre in certain lights; tarsal joints somewhat darker with white rings. Wings limpid, ferruginous on the anterior border; all the veins and the fringe brown scaled.

*Length*.—3 mm. (♀)."

7. *TAENIORHYNCHUS ANNETTII*. n. sp.

Thorax brown, with bright brown and creamy-yellow curved scales, the brown scales forming a patch on each side of the

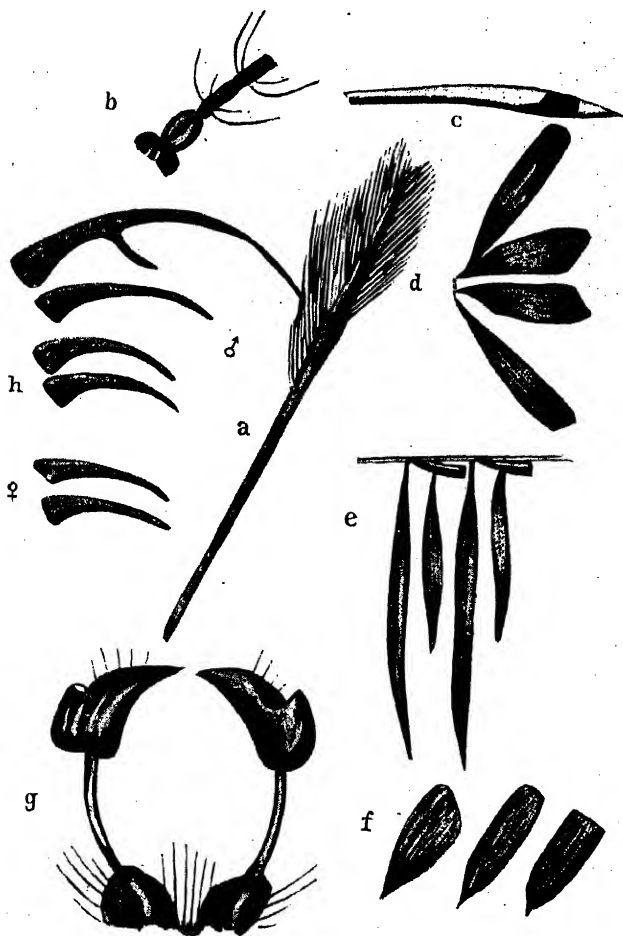


Fig. 250.

*Taeniorhynchus Annettii*. n. sp.

a, Palpus of ♂; b, basal joints of antennae; c, apex of ♀ proboscis; d, scales on veins; e, wing fringe scales; f, detached wing scales; g, male genitalia.

mesonotum in front; the pale scales especially form a median line, and extend over the posterior part of the mesonotum.



Abdomen yellow, with dark apical bands to the segments. Legs yellow, with the apices of the joints black. Wings yellowish, most of the veins bright yellow scaled, but some with lateral black scales. Ungues of the ♀ equal and simple; of the ♂ unequal, the larger uniserrated, the smaller simple.

♀. Head brown, with narrow curved pale yellow scales, almost white ones round the eyes, and with long thin yellowish and brown upright forked scales; antennae brown, basal joint yellowish-brown; second joint rather swollen, verticillate hairs brown, placed close to the base of the joints; palpi densely scaled, dark brown at the base and apex; proboscis yellow, black at the apex, apex swollen, acuminate; clypeus ochraceous-brown; thorax pale brown, with longish golden curved hair-like scales, which become golden-brown on each side in front; the scales in the middle of the mesonotum form more or less of a line; two lateral lines of golden-brown bristles and traces of a median line, as well as numerous long ones over the roots of the wings and at the sides; scutellum pale ochraceous, with variable number of median bristles, four in the type; metanotum chestnut-brown.

Abdomen covered with dense flat yellow scales, the apical borders of the segments being broadly banded with violet scales, more or less metallic, and with small golden bristles.

Legs yellow, with yellow scales, traces of narrow apical blackish bands on all the joints of the fore and mid legs, very faint on the last two tarsal joints, in the hind legs the dark apices of the joints are more distinct; at the apices of the joints are also dark brown bristles; unguis black, equal, simple, nearly straight.

Wings with yellowish veins and long dull yellowish lateral scales, and some scattered dark ones, most of the sixth vein dusky



Fig. 251.

*Taeniorhynchus Annettii*. n. sp. (♀). (X. 9.)

scaled; fork-cells both long and narrow, the first sub-marginal cell longer than the second posterior cell, very little narrower; posterior cross-vein rather more than its own length distant from

the mid cross-vein; lateral scales of the veins rather elongated and thick; median ones paired, thicker, their apices rather oblique; border-scales broad convex at the apex; halteres pale ochraceous.

*Length*.—4·8 to 5 mm.

♂. Proboscis ochraceous-yellow, dusky at the base and tip; palpi yellowish, the apical joint mostly dark brown, apices of the penultimate and antepenultimate dark brown, the long joint with a narrow blackish ring on its basal half; the last two joints and the apex of the antepenultimate with long black and yellow hairs; antennae yellowish, with narrow dark bands, plume hairs brown, flaxen at the base; chaetae of the mid lobe of the scutellum asymmetrical, four long dark ones, two small median pale ones, and an asymmetrical one on one side.

Abdomen as in the ♀; first segment with some dark median scales, with long dense yellow pubescence.

Ungues of the fore and mid legs unequal, the larger one uniserrated, hind equal and simple.



Fig. 252.

*Taeniorhynchus Annettii*. n. sp. (♂). (X. 9.)

Wings with the scales lateral only, scales short and rather broad; fork-cells short, base of the second posterior nearer the base of the wing; posterior cross-vein more than its own length distant from the mid cross-vein.

Halteres pale ochraceous; male genitalia, with the claspers, swollen and beak-shaped at the end.

*Length*.—4·8 mm.

*Time of capture*.—April.

*Habitat*.—Old Calabar. (C. No. 4.) (Annett.)

*Observations*.—A very beautiful species, brought home by Dr. Annett. The male has very peculiar genital armature (Fig. 250, g).

## 8. TAENIORHYNCHUS FULVUS. Wiedemann.

*Culex flavicosta.* Walker.

(Ausseurop. Zweiflüg. Ins. p. 546 (1828), Wiedemann; Ins. Saund. p. 431, Walker.)

Thorax yellowish in front, darker behind, with yellow scales in front and dark behind; abdomen with rather hairy yellowish-brown scales; legs yellowish, with dark brown basal bands to the hind tarsi; wings brown at the tip, yellow along the costa.

♀. Head yellow, with narrow, hair-like, small yellow scales and small black and ochraceous forked ones behind; palpi clothed with yellow scales, black at the apex; clypeus yellow; antennae with basal joint and base of the second joint yellowish, rest dark brown.

Thorax yellowish in front, clear yellowish-brown behind, with small hair-like curved scales in front and forming a line down the middle with narrow hair-like dark scales behind and with two rows of golden bristles; scutellum yellowish-brown, with fine hair-like black scales and golden-brown bristles; metanotum chestnut-brown; pleurae brownish, with a broad dark line over the coxae.

Abdomen entirely covered with bright ochraceous scales with a distinct lustre; venter dusky yellow.

Legs covered with yellowish scales, apices of the femora black; in the hind legs the metatarsi and tarsi have broad basal dark bands, which involve most of the joints on the last three tarsi; unguis small, equal, and simple.

Wings with the costa, first long vein and sub-costal yellow scaled, the apex of the wing densely brown scaled and the rest of the wing field slightly ornamented with brown scales; first sub-marginal cell a little longer and narrower than the second posterior, its base nearer the apex of the wing than that of the second posterior, its stem yellow scaled about two-thirds the length of the cell; stem of the second posterior about as long as its cell; supernumerary and mid cross-veins in one line; posterior not quite its own length distant from the mid cross-vein; fringe rather bronzy.

Halteres ochraceous brown.

Length.—5 to 6 mm.

Habitat.—Amazon Region (Walker); Brazil (Wiedemann); Tropical? (Bigot).

*Observations.*—I have not seen Wiedemann's type of *C. fulvus* from Brazil, but it is a very distinct species judging from his description, the wings being brownish-black at the apices, the dark-tipped yellow proboscis, palpi, femora, and tibiae being very characteristic of this yellow species, which, however, when rubbed, shows a dark ground colour. I have examined Walker's type of *Culex flavicosta* in the Museum collection and find it is only this species of Wiedemann's, and I have also seen another specimen from Bigot's collection, named by him *C. bicolor*. n. sp.

Walker's species, therefore, must sink. I have described Walker's specimen as fully as possible here and compared it with Bigot's.

9. *TAENIORHYNCHUS AURITES*. n. sp.

(Fig. 88, Pl. XXII.)

Thorax bright orange-yellow, with brilliant golden-yellow curved scales. Abdomen orange-yellow, with flat scales of a similar colour. Legs, wings and head also orange-yellow; legs with dark bristles, apices of the hind metatarsi, first tarsal, and all the last three joints, dark scaled. Ungues equal, black, simple.

♀. Head fawn coloured, with narrow curved orange-yellow scales, and deeper orange, long thin upright forked ones; flat orange scales at the sides of the head; palpi orange scaled, except at the tip, where there are a few brown scales; antennae

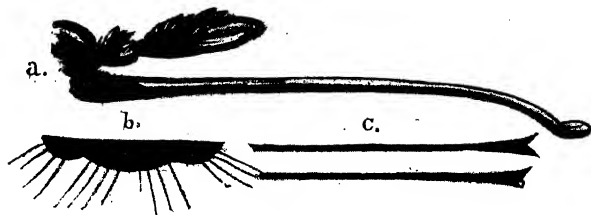


Fig. 253.

*Taeniorhynchus aurites*. n. sp.

a, Proboscis, palpi, and clypeus of ♀; b, scutellum; c, upright forked scales of the head.

orange-yellow at the base, the basal and next five joints being yellow, brown apically, the last few joints being dark brown; proboscis orange-brown, dark at the apex, and with a few brown scales at the base.

Thorax dusky yellowish-brown, with a median dark line, covered fairly closely with narrow curved hair-like bright golden-orange scales; with two rows of dark brown bristles, and a row of long golden-brown ones over the roots of the wings; scutellum pale yellowish-brown, with golden border bristles, those of the mid lobe asymmetrical, four on one side and three on the other; there is, however, a trace of a small fourth bristle; covered with narrow curved pale golden scales; metanotum ochraceous or yellowish-brown; pleurae yellow, with fine yellow hairs and bristles, and a patch of dull white semi-transparent scales placed parallel with the long axis of the body.

Abdomen yellow, densely clothed with flat orange-yellow scales and with yellow bristles; venter rather pale orange-yellow.

Legs yellow, clothed with orange-yellow scales, femora and tibiae with brown bristles; in the hind legs the apex of the tibia, metatarsi and first tarsal black scaled, the last three tarsi entirely black scaled, the base of the second may be yellowish; unguis rather large, equal, simple, black.

Wings tinged with orange, and with orange veins and yellow scales; veins thickly scaled, with double and treble median rows, and rather broad long lateral scales, but not so long as in the typical *Culex* wing; first sub-marginal cell longer and narrower

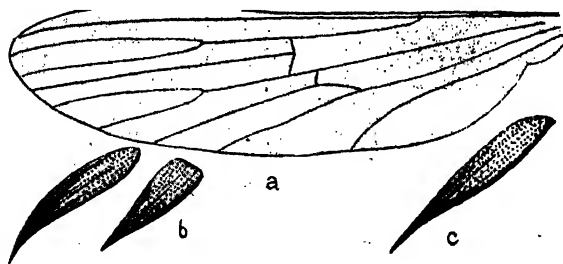


Fig. 254.

*Taeniorhynchus aurites*. n. sp.

a, Wing of ♀ (X. 12); b and c, wing scales.

than the second posterior cell, its stem equal to about one-third the length of the cell, bases of the fork-cells nearly level; stem of second posterior cell equal to about half the length of the cell; posterior cross-vein about twice its own length distant from the mid cross-vein.

Halteres yellow.

Length.—5 mm.

*Habitat*.—Bonny, West Africa (Annett).

*Time of capture*.—May.

*Observations*.—Described from several females in Dr. Annett's collection. It constitutes a very marked and beautiful species, entirely orange-yellow, except the apices of the hind legs and the apices of some of the joints.

10. *TAENIORHYNCHUS ACER*. Walker.

(List Brit. Mus. p. 7.)

(Fig. 91, Pl. XXIII.)

Thorax golden-yellow, with traces of brown markings; abdomen orange-yellow, the first four segments apically banded with metallic purple and also traces on the other segments. Legs unbanded, covered with dark black scales, except at the coxae and bases of the femora.

♀. Head brown, with testaceous scales, a pale border round the eyes above, with some black and yellowish bristles; eyes black; basal joint of the antennae yellowish, remainder brown; palpi dark yellowish-brown; proboscis covered with dark black scales with a very dark purplish reflection.

Thorax golden-yellow, the front scales being very bright and metallic; scutellum bordered with long yellow bristles; metanotum testaceous, pleurae pale testaceous, with some bright reflections and a dark area beneath the root of the wings. There are traces of brown markings on the thorax which cannot be made out.

The abdomen brilliant orange-yellow, the first four segments apically banded with metallic purple, the other segments showing traces of the metallic banding (probably rubbed), clothed with orange-yellow hairs, densely so at the apex, venter similarly marked to the dorsum.

Wings testaceous at the base, veins densely clothed with longish brown scales, costa and first longitudinal very dark brown scaled; base of the second posterior cell nearer the base of the wing than the base of first sub-marginal cell.

Halteres testaceous with dusky knob.

Legs with coxae orange-yellow, femora orange-yellow at the base, apically metallic black, rest of legs clothed with metallic black scales showing purplish and slight golden reflections—general appearance of legs dark metallic black.

*Length*.—5 min.

♂. Head with pale greyish scales, a dark line running down the middle; palpi as long as the proboscis, dark brown at the tip, paler basally, with a small pale band about one-third of the length from the base; proboscis dark brown, slightly paler towards the tip; antennae banded brown and white, with yellowish-brown verticils.

Thorax bright testaceous, with long bristles, dark in some lights, yellowish in others.

Abdomen similar to female, but the apex and genitalia deep brown.

Legs as in ♀, but the femora are darker. Wings rather paler. *Length*.—5 to 5.5 mm.

*Habitat*.—Bupengary, Queensland; a single ♂ and ♀ collected by Dr. Bancroft (5. 12. 1899); New Zealand (Walker).

*Observations*.—The ♀ seems somewhat rubbed, but the species can easily be distinguished by its general bright orange-yellow colour, dark metallic legs and metallic purplish abdominal banding.

Judging from the much-damaged type of Walker's *C. acer* from New Zealand, I should say the insect described here is undoubtedly this species. Walker describes the legs as being yellow shaded, with darker colour at intervals. The legs are evidently rubbed, and thus giving the specimen that appearance.

#### 11. TAENIORHYNCHUS BREVICELLULUS. n. sp.

(Fig. 89, Pl. XXIII.)

♀. Head brown, with long ochraceous upright forked scales, a pale border round the eyes, numerous small pale scales over the occiput and pale flat scales at the sides; golden-brown bristles projecting over the eyes; clypeus pale brown; palpi densely scaled with bronzy scales and hirsute; five-jointed, the last nipple-shaped, penultimate shorter than the antepenultimate; antennae deep brown, with narrow pale bands at the verticils; proboscis deep brown.

Thorax appearing bright ochraceous in some lights with two deep purplish patches behind, dull purplish in other lights, covered with narrow curved golden scales, particularly thick in three rows following the three rows of bristles; scutellum deep purplish in the middle, bright ochraceous at the sides; metanotum deep brown; pleurae purplish-brown and ochraceous with two distinct patches of white scales and others scattered about.

Abdomen deep dull ochraceous-brown when denuded, covered with deep purple scales, each segment with a narrow dull yellowish to ochraceous basal band; on the last three segments the yellow scales are more abundant and irregularly scattered about, posterior border-bristles dull pale golden and brown, the apex densely hairy, hairs golden.

Legs covered with deep metallic purple and bronzy scales all over, except the base and venter of the femora, which are bright rich ochraceous. Ungues equal and simple.

Wings with the veins with brown scales only, those along the costa rather dark; first sub-marginal cell very little longer but narrower than the second posterior cell, both cells short; the base of the first sub-marginal nearer the apex of the wing than that of the second posterior cell, its stem nearly as long as the

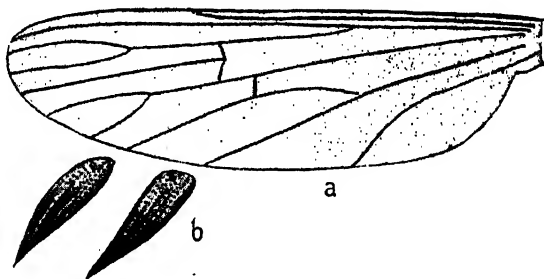


Fig. 255.

*Taeniorhynchus brevicellulus*. n. sp.

a, Wing of ♀ (X. 12); b, wing scales.

cell; stem of the second posterior cell nearly the same length as the cell; posterior cross-vein twice its own length distant from the mid cross-vein; fringe and border-scales brown. Halteres with ochraceous stem and slightly dusky knob.

*Length*.—4.8 mm.

♂. Head similar to ♀; palpi and proboscis brown, the latter expanded apically; palpi of ♂ five-jointed, the last joint small, the penultimate long; antennae brown, with pale bands and brown silky plumes.

Thorax dull yellow and purple, pleurae pale purplish-brown in the middle with two pale grey patches of scales; scutellum and metathorax yellow, the former with four golden bristles as in the ♀.

Abdomen clothed with purplish scales, almost black on the front segments; when seen with a lens, each segment with a



basal band of yellow scales which increase in size posteriorly; anal segment dark, with steel-blue and purple reflections, the whole abdomen covered with fine long golden hairs; genitalia with the basal joint yellow at the base, purple at the apex, claspers yellow.

Legs yellow at the base, all the remaining parts dark scaled, almost black in some lights, with an ochraceous metallic lustre

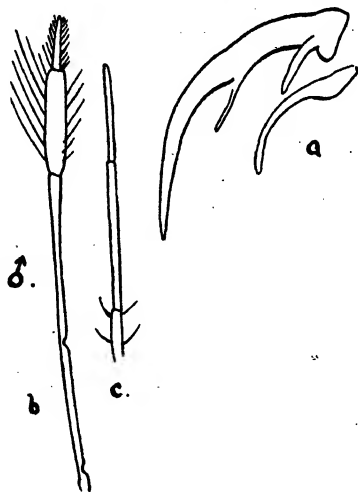


Fig. 256.

*Taeniorhynchus brevicellulus*. n. sp.

a, Fore unguis of the ♂; b, male palpus;  
c, apex of ♂ antenna.

in others. Ungues of the fore legs unequal, the larger one with a large and a small basal tooth, mid claws with one tooth, hind equal and simple.

Wings with brown scaled veins, both fork-cells very short, the first sub-marginal cell narrower than second posterior cell, slightly longer, the base of the second posterior cell nearer the base of the wing than that of the first sub-marginal; their stems long.

*Length*.—3·5 to 4·8 mm.

*Habitat*.—Selangor (Wray); Thayetmyo, Burma (Watson).

*Time of capture*.—August.

*Observations*.—Described from a couple of ♀'s and a ♂ from Burma and some ♀'s from Malay. The species can readily be told from the other yellow *Taeniorhynchi* by the extremely short fork-cells in the ♀.

GENUS 14.—**DEINOCERITES.** nov. gen.

Head ornamented with curved thin flat scales on the vertex and occiput, and with long forked upright scales which are fimbriated at the apex as well as forked (Fig. 257, c); thorax with flat curved spindle-shaped scales; abdomen covered with flat scales. Palpi of ♀ short, three-jointed; of the ♂ long; *antennae with the second joint very long, as long as the three following joints*; much longer than the proboscis. Wing scales median and lateral, median rather short and broad, lateral elongated,

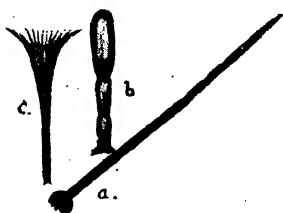


Fig. 257.

*Deinocerites cancer.* n. sp.

a, Female antenna; b, female palpus; c, forked scale of head.

broader than in *Culex* (*vide* Plate D). Ungues of the ♀ equal and simple.

A single species only of this genus at present occurs, the distinguishing generic character being the long antennae with the greatly elongated second joint, which exists in no other gnat to the same extent, although we get an elongated and swollen second joint in the *Megarhinas*. I have not seen a male, but judging from the general structure of the female it certainly approaches *Culex*.\*

**DEINOCERITES CANCER.** n. sp.

(Fig. 125, Pl. XXXII. and Pl. D.)

Thorax blackish, brown towards the scutellum, with scattered bronzy-black scales. Abdomen blackish-brown, with deep umber-brown scales; venter paler. Legs brown with bronzy reflections;

\* Dr. Graham has recently sent me a ♂ from Jamaica. The palpi are long, like a typical ♂ *Culex*.

coxae pallid; femora yellowish at the base and underneath. Ungues of the female equal and simple.

♀. Head blackish-brown, with greyish flat curved scales, somewhat creamy coloured towards the front, with scattered brown forked upright scales; antennae bright brown, basal joint yellowish, base of the second joint the same, fourteen-jointed, *second joint very long*; palpi covered with chocolate-brown scales; clypeus bright chestnut-brown; proboscis blackish-brown, darkened and expanding towards the tip, paler at the base; eyes deep purplish-black.

Thorax black, brown towards the scutellum in some specimens, with scattered curved flat bronzy-black scales, with deep chestnut-brown to black bristles; two rows of bristles down the dorsum of the mesonotum; scutellum brown, with dark scales and chestnut-brown to black bristles; metanotum deep purplish-black; pleurae chestnut-brown.

Abdomen steely-black, entirely covered with umber-brown and dark brown scales, the posterior borders of the segments with small golden-brown bristles; venter brown, thickly clothed with paler scales. When held in some lights the abdomen has an ochraceous tinge in parts.

Legs covered with brown scales, which give them bronzy-yellow reflections in some lights; coxae pale, with a row of long bristles above each; femora beneath deep yellowish-brown; hind metatarsi a little shorter than the hind tibiae. Ungues equal and simple, fore and mid rather long, hind small.

Wings with brown scales, those on the second long vein and its fork clavate, those on the remainder rather more truncated and with lateral long club-shaped ones in addition, except on the stem of the fourth and base of the fifth veins; first sub-marginal cell longer but about the same width as the second posterior cell, the cell two and a half times the length of the stem, its base nearer the base of wing than that of the second posterior cell; stem of the



Fig. 258.

Wing of *Deinocerites cancer* (♀).  
(X. 9.)

second posterior cell much longer than that of the former cell, about two-thirds the length of the cell; posterior cross-vein longer than the mid cross-vein, about one and a fourth times its own length distant from it.

Halteres with deep ochraceous stem and blackish knob.

*Length.*—3.5 to 4.2 mm.

*Habitat*.—Jamaica (Dr. Grabham, 8. 2. 1900, 24. 11. 1899); St. Lucia (Otto Galgey, 21. 12. and St. George Gray, 19. 7. 1899). (♂ & Gl.)

*Time of capture*.—St. Lucia in July and November; Jamaica in October.

*Observations*.—Dr. Grabham sends a few ♀'s of this species from Jamaica, with the following note, "Crab-hole form along the sea-coast; the water in the holes is brackish."

A rather obscure species which seems to be abundant in the West Indies, evidently appearing at dusk, as Mr. Galgey places the time of capture 7 P.M. on his labels. Dr. Grabham bred this species from larvae from pools along the Spanish Town Road and crab-holes near the seashore. It is the prevalent form during the rainy season, and is very abundant at Kingston, Jamaica.

The structural peculiarity of the antennae in having the greatly elongated second joint is taken as the distinguishing feature of the new genus, in which I propose to place this species.

## SUB-FAMILY AEDEOMYINA.

*(Proboscis short in both sexes.)*

## GENUS 15.—AEDEOMYIA. nov. gen.

Head with only upright narrow fan-shaped scales (Fig. 259, a); clypeus scaly; palpi short in both sexes, scaly; antennae fourteen-jointed in the ♀, basal joints scaled; in the ♂ the last two joints (Fig. 12, 3) are shorter than in *Culex*, and broad. Thorax with broad flat spindle-shaped scales (b); scutellum with flat broad scales (c). Abdomen densely scaled with flat scales. Legs densely scaled, especially at the apices of the femora and bases of the tibiae; ungues (Fig. 261, IV. and V.) of ♀ equal and simple, of fair size on the hind legs; of the ♂

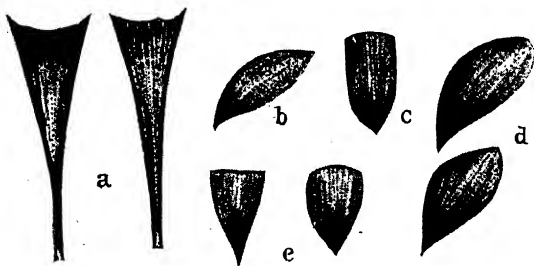


Fig. 259.

Scales of *Aedeomyia squammipenna*, Arribalza.

a, Head scales; b, scales of thorax; c, of scutellum; d, of wing; e, of pleurae.

unequal on the fore and mid legs, the larger one toothed; equal on the hind legs. Wings densely scaled with broad scales (d) somewhat similar to those in the genus *Panoplites* and also with elongated lateral ones (*vide* Plate E); border-scales large, and fringe scales at the base of the wing very long (Fig. 261, II.); fork-cells unequal, base of the second posterior cell nearer the base of the wing than the base of the first sub-marginal cell; posterior cross-vein nearer the root of the wing than the middle cross-vein; sixth long vein nearly straight.

This genus is closely related to *Aedes*, but differs from it in the curious scale formation on the head, wings, &c. It occurs in South America, India, Malay Peninsula and Australasia. *Ae. squammipenna* was placed in the genus *Aedes* by Arribalzaga, but it differs from the typical *Aedes* in scale structure, and thus the characters given by him for *Aedes*, except the equal-sized

**DISTRIBUTION OF THE GENUS *AEDEOMYIA* n.g. ■  
& *CULEX NIGRIPES*. ZETT. (x x)**

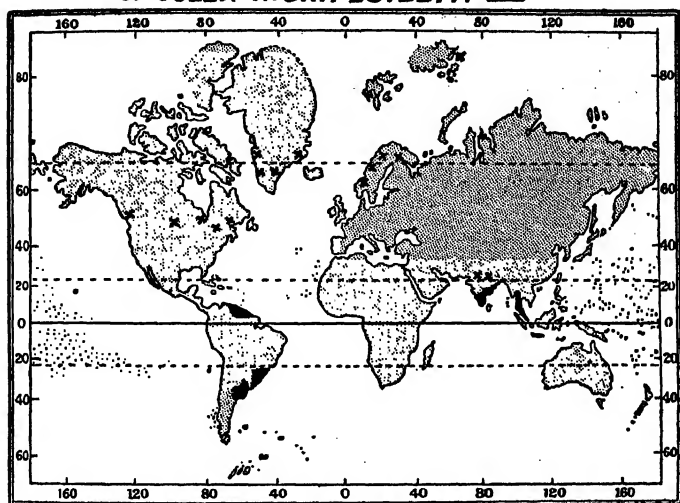


Fig. 260.

palpi of ♂ and ♀, cannot be accepted, his characters being based on this species. Skuse describes one from Sydney (*Aedes venustipes*), and notes the peculiarity of the scales, and then suggests their being of generic importance, in which I concur. As far as the ♀'s go they resemble in scale structure *Panoplites titillans*, but the ♂'s, as seen in *Ae. squammipenna*, are of *Aedes* type, having short palpi, but similar scales on the wing to the ♀.

**1. *AEDEOMYIA SQUAMMIPENNA*. Arribalzaga.**

*Aedes squammipennis*. Arribalzaga.

(El Nat. Arg. i. 151, 3 (1878), and Dipt. Arg. p. 62 (1891), Arribalzaga.)

(Fig. 124, Pl. XXXI. and Pl. E.)

Thorax brown, with scattered creamy-yellow scales in the middle and with white scales at the sides and behind; scutellum

ochraceous, with black scales at the sides and creamy ones in the middle. Abdomen brown, with two patches of creamy scales apically and two patches of white scales basally, apical segments yellow scaled. Legs banded, covered with creamy, purple and white scales, apices of mid femora with a dense tuft of dark scales (Fig. 261, I.).

♀. Head dark brown, with white scales in front, creamy scales behind and dark scales at the sides; a tuft of broad creamy scales sticking out between the eyes, a band of a few long chestnut-brown bristles around the eyes; eyes dark blackish-purple; clypeus black, with two streaks of white scales; palpi covered thickly with black scales, white scaled at the apex and at the apex of the penultimate joint; antennae almost black, with white pubescence and dark hairs; basal joints with deep yellow scales and a dense brush of black scales; proboscis black scaled, broad, with two narrow white bands, apex pale. In the Madras specimens there is no yellow at apex, and an additional white spot on the proboscis near the base.

Thorax dark brown, with scattered creamy-yellow scales in the middle and white scales at the sides and behind, with black bristles; scutellum ochraceous, with a tuft of black scales on each side and a few scattered creamy ones in the middle; metanotum deep clear brown; pleurae dark brown, with patches of white and creamy scales.

Abdomen covered with dull brown scales (dusky purple under microscope), each segment with two patches of creamy scales posteriorly and with two patches of white scales basally, apical segments with bright yellow scales; each segment bordered posteriorly with golden hairs; ventrally the abdomen is yellowish towards the base, black with basal patches of white scales towards the apex. There is much variation in the abdominal ornamentation in specimens from different parts of the world.

Legs banded, yellow, covered with creamy, purple and white scales; fore tibiae with faint paler bands; metatarsi with two narrow bands of white scales and with the first and second tarsal joints broadly basally white, last two joints dark; mid femora mottled with yellow and brown scales, the apex being adorned with a large tuft of long dark scales, the extreme apex yellow scaled; tibiae dark scaled, with seven narrow white band-like marks, the last apical; metatarsi with two white bands and the apex white, first two tarsi basally white, third slightly so, fourth dark. Hind femora dark, with a few scattered

white scales and a yellow apex, tibiae with seven white bands, the last apical; metatarsi with two or three narrow white bands and white apex; first tarsal joint basally white, apical,

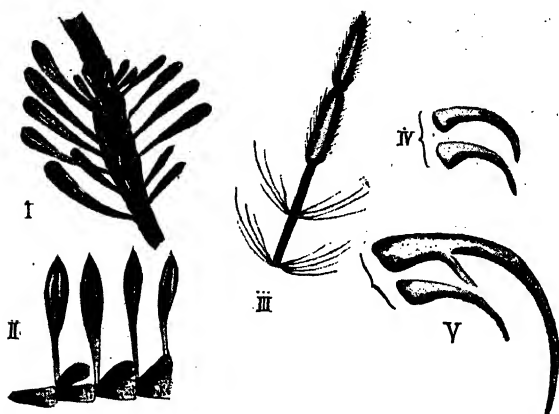


Fig. 261.

*Aedeomyia squammipenna*, Arribalzaga.

I. Leg tuft; II. Wing fringe; III. Apex of male antenna;  
IV. Female unguis; V. Male unguis (fore).

half dark with a crown of white scales, second tarsal joint white, with a narrow black band near the apex and a crown of white scales round the apex, third the same, fourth almost pure white, with some black scales beneath at the apex.

Wings densely scaled with broad purple and yellow scales; on the costa are three clear white patches, the two middle ones forming two bands partly across the wing, the apical one also continuing as a broken band around the end of the wing; there is also a white patch between each band in the middle of the wing field. Border-scales narrow, double rowed and broad at the base of the border.

Halteres with pale stem and dark knob.

*Length*.—4 to 4.5 mm.

♂. Head dark brown, with creamy scales in the middle, deep ochraceous ones at the sides, and then a few pale ones below; palpi short, covered with black and white scales in broken bands; proboscis black scaled, with two white bands towards the middle and white scales beneath near the tip (there is also a bare ochraceous band towards the tip which should probably be clothed with black scales), and a white patch looking like a band on the upper side near the base; antennae banded



black and white, with black plumes, the last two joints short and broad.

Thorax deep brown, with flat spindle-shaped yellow scales in the middle, white ones at the sides and creamy ones behind and with black bristles; scutellum with creamy scales in the middle and a few black ones; black scales on each lateral lobe; metanotum deep purplish-brown, with a testaceous tinge at the sides; pleurae deep brown, with scattered white scales.

Abdomen with the first few segments almost entirely covered with creamy-yellow scales, apical ones with purplish-brown scales, the apical borders with yellow scales and some white ones at the sides, and a few white scales dotted over the base of the last two segments.

Legs and wings as in the ♀. Ungues of the fore and the mid legs large, black, unequal, the larger only with a distinct tooth; hind unguis equal and simple.

Wing fringe purplish-brown, white in some lights at the ends of the veins.

*Length*.—3.5 mm.

*Habitat*.—British Guiana (Rowland); Brazil (Lutz); Argentine (Arribalzaga); Madras (Cornwall); Perak (Wray).

*Time of capture*.—February, in British Guiana.

*Observations*.—I have examined several specimens from the above localities and can find no differences except in slight colour variations. This species can at once be told by the curious tuft of long scales on the mid and hind femora, and by the three white spots on the costa, and the broken white bands arising from them, on the densely broad-scaled wings. In the Guiana specimen the proboscis has a few yellow scales at the base and is black at the tip, there being two distinct white bands; the antennae are also more distinctly broadly banded with black and white, and the wings are slightly darker than in the Malay specimen, and the hind femoral tufts are more distinct, and traces may also be seen in the fore legs, probably in the single Malay specimen they are denuded. The specimens given me by Captain Cornwall from Madras are somewhat darker than the Malay specimen also, and some show two rather indistinct black spots of scales on the mesothorax, and the centre of the mesonotum has a broad band of yellow scales and traces of a third band on the proboscis. Some specimens from India show two white costal spots only.

In all respects these specimens answer to Arribalzaga's *Aedes*

*squammpennis*, the crests of long scales on the legs being a very marked character. They are certainly very different to the true *Aedes*, and I have thus placed them in the new genus *Aedeomyia*.

It inhabits houses, and bites, but not severely.

Arribalzaga's specimens were taken in April on the window-panes of a house in Buenos Ayres. Dr. Lutz writes me that this species occurs in the same place as *Uranotaenia pulcherrima*, and that he has bred them from the larvae and that he has not observed it to sting.

## 2. *Aedes* (*Aedeomyia*?) *venustipes*. Skuse.

(Proc. Linn. Soc. N. S. Wales, iii. p. 1761 (1889))

"Proboscis deep brown, somewhat spotted with white scales, with a white ring in the middle and another rather broader one before the terminal lobes. Thorax deep brown, densely clothed with a mixture of brown and yellowish scales, with three oblong patches of yellowish scales, one apical and two lateral, on the anterior moiety of the thorax; pleurae deep brown, with scattered white scales; scutellum with yellowish-brown scales. Abdomen densely clothed with brown and white scales, the latter predominating laterally and beneath. Legs slender, coxae deep brown, with white scales; femora, tibiae and tarsi brown, thickly covered with very small white rings and spots, except in the tarsi of the hind legs, in which the whole of the third and most of the fourth (except at the apex) joints are purely white; in hind legs the tibiae are three-quarters the length of metatarsus. Wings with all the veins thickly beset with somewhat broad more or less elliptical brown and yellowish scales, chiefly the former, which almost completely cover the wings; the mid cross-vein the same length as the posterior cross-vein, situated considerably beyond the latter and about opposite the middle of the posterior branch of the fifth long vein; second posterior cell about the same width as, but scarcely shorter than, the first sub-marginal cell, its base lying before that of the latter.

*Length*.—3·81 mm.

*Habitat*.—Elizabeth Bay, near Sydney (Skuse), one specimen."

NOTE.—Skuse describes this species from a single ♀, and points out the peculiarity of the "broad more or less elliptical wing scales," and says "it may be a peculiarity of the genus." Unless this refers to a *Panoplitcs*, it must belong to this genus, which differs so markedly from the true *Aedes*. I have seen a bad specimen of a *Panoplitcs* from Australia, but it scarcely answers to Skuse's description. His species will, I think, prove to belong to this genus, particularly when we note that he describes it as an *Aedes*.

GENUS 16.—**Aedes**. Meigen.

(Dipt. Besch. i. p. 13 (1818), Meigen; Suit. a Buff. i. p. 37 (1834), Macquart; Hist. d. Ins. ii. p. 454 (1845), Blanch.; Dipt. Scand. (1850), Zetterstedt; Ins. Brit. Dipt. iii. (1851), Walker; Fauna Austr. ii. (1864), Schiner; Bull. Soc. Ent. Ital. (1896), p. 299, Ficalbi.)

This genus, which has always contained a small number of species, has recently been further reduced by the formation of the following genera: *Haemagogus*, Williston, *Uranotaenia*, Arribalzaga, and *Aedeomyia*, and *Wyeomyia*, nihi.

The genus, as it now stands, contains mostly dull-coloured mosquitoes of small size, and at present occurs in Europe, Africa, and North America; the few species differ very much in appearance from the three genera mentioned above, and could not be confused with them, in spite of the palpi being similar in ♂ and ♀, the essential character of Meigen's genus *Aedes*.

The characters of the restricted genus *Aedes* I make as follows:—

Head clothed with both flat broad scales and narrow curved ones over the occiput, the former always predominating, the latter sometimes nearly absent; thorax with narrow curved scales; scutellum usually with four bristles to the mid lobe; palpi short, *apparently* two-jointed in both ♂ and ♀, always much shorter than the proboscis, rounded apically, scaly, and with a few bristles and hairs; scutellum with narrow curved scales; antennae fourteen-jointed, plumose in the ♂, pilose in the ♀, the second joint often rather swollen; proboscis about the length of the antennae. Wings rather long, the scales much as in *Culex*, the lateral ones long and slender; the first sub-marginal cell generally longer and narrower than the second posterior cell, both cells of moderate length. Legs with the unguis of the ♀ both equal and toothed or simple, of the ♂ unequal, the larger toothed, the small toothed or not.

The essential characters are:—

- (i) the palpi short in both sexes;
- (ii) the palpi two-jointed;
- (iii) the wings clothed with ordinary scales as in *Culex*;
- (iv) curved scales only on thorax and scutellum.

In regard to the number of joints in the palpi there is some difference of opinion. Ficalbi says they are two-jointed, with a

trace of a third joint. I cannot find more than two joints, but there is a basal notch which might be mistaken for a joint.

The characters given by Arribalzaga and Skuse do not apply to the genus *Aedes* as intended by Meigen, who described only one species originally, namely, *Aedes cinereus*; both Arribalzaga's *Aedes squammipennis* and Skuse's *Aedes venustipes* being quite different types of insects from the European *Aedes*, and hence I have separated them and formed the genus *Aedeomyia*.

Meigen's description\* of the genus is as follows:—

“Antennae porrectae, filiformes, 14-articulatae; maris plumosae, feminae pilosae. Proboscis porrecta, longitudine thoracis. Palpi brevissimi. Alae squamatae, incumbentes.”

Ficalbi, who has added most to our recent knowledge of this family, adds little of value to Meigen's characters for universal species.

*Life-history of Aedes*.—Little or nothing is known of the metamorphosis of the members of this genus. Osten-Sacken bred *Aedes fuscus*, but gave us no information as to the larvae, &c., except the wide statement that they present a general resemblance to those of *Culex*.

It appears that neither the ♂ nor ♀ attacks animals or man, as a rule, at least no mention has been made of them doing so in any communications received with the collections that have been sent from abroad.

With regard to our European species, Ficalbi states that they do not attack man or mammals.

From the numbers received from E. M. Walker, from Ontario, I should judge, however, that they are more or less troublesome, but no note was sent to that effect. *Ae. Butleri* is said to be troublesome in the Malay Peninsula.

Very few species have been received in the collections. Four new species have been received, which I should unhesitatingly have placed as three *Culex*, had the scale structure not been examined; but all four (*Ae. Butleri*, *Ae. nigricorpus*, *Ae. nigra*, and *Ae. Pembaensis*) have broad scaled heads and narrow scaled scutellum, which we find in this genus. No males of them have been received; but the scale structure shows them to belong here, and separates them from the *Stegomyias*.

\* Syst. Besch. Europ. Zweiflügel Ins. p. 13 (1818).

## SYNOPTIC TABLE OF AEDES.

## A. First sub-marginal cell longer than the second posterior cell.

## a. Abdomen banded.

Abdomen with dusky black scales and basal crescentic bands of creamy scales ..... *fuscus*. Osten-Sacken.

## aa. Abdomen unbanded, with white lateral spots.

Abdomen deep black, with lateral white patches; stem of first sub-marginal cell nearly half the length of the cell; wings and legs black ..... *Butleri*. n. sp.

Abdomen, &c., as in *Butleri*, but fork-cells much longer ..... *nigricorpus*. n. sp.

## aaa. Abdomen unbanded and unspotted.

Abdomen brownish black, with apparently no lateral white patches; wings yellow, of a general grey tint ..... *cinereus*. Meigen.

Thorax reddish brown, with median and lateral darker lines ..... *rufus*. Gimmerthal.

Abdomen yellow to yellowish brown ... *perturbans*. Williston.

## AA. First sub-marginal cell as long as the second posterior cell.

Abdomen with basal white lateral spots *Pembaensis*. n. sp.

Abdomen entirely black; thorax brown, pleurae pale ..... *niger*. n. sp.

## 1. AEDES FUSCUS. Osten-Sacken.

(Bull. U.S. Geol. Surv. p. 191.)

(Fig. 126, Pl. XXXII.)

Thorax deep blackish-brown, with narrow curved golden-brown scales. Abdomen steely-black, with dusky scales, second segment with a median basal patch of cream-coloured scales, third to fifth with basal crescentic pale bands, a few pale scales also on the base of the sixth, sometimes unbanded. Legs bronzy-black, with metallic lustre; femora with white scales below. Ungues of the ♀ equal, uniserrated, of the ♂ unequal in fore and mid legs, the larger uniserrated, the smaller simple, hind equal, uniserrated.

♀. Head clothed with flat dark dusky-black scales, with a line of yellow to orange curved scales in the middle and a patch

of flat yellow scales on each side, continuous with a narrow line of yellow scales round the eyes, then black flat scales again at the sides, a few brown upright forked ones near the neck; antennae dark brown, basal joint testaceous on one side, purplish-brown on the other, basal half of second joint testaceous; palpi very short, almost black; proboscis black; eyes black; clypeus deep brown.

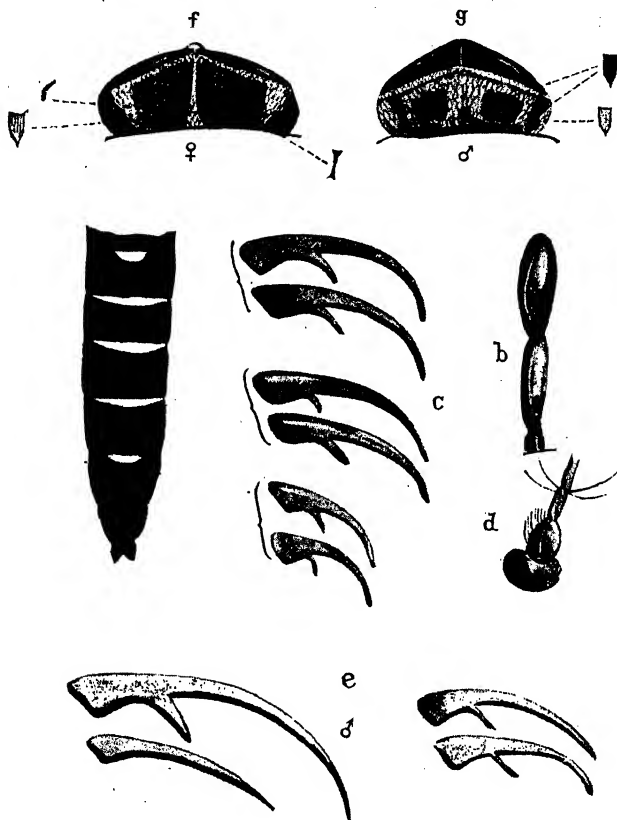


Fig. 262.

*Aedes fuscus*, Osten-Sacken.

a, Abdominal ornamentation of ♀; b, palpus of ♂; c, unguis of ♀; d, basal joints of antennae in ♂; e, fore and hind unguis of ♂; f, head of ♀; g, head of ♂.

Thorax nearly black, clothed with deep bright golden-brown thin curved scales, paler near the scutellum; scutellum deep purplish-brown, testaceous at the sides, with pale golden curved scales and golden-brown bristles on the posterior border; meta-

notum bright umber-brown; pleurae chestnut-brown, with patches of white scales.

Abdomen steely-black, clothed with dusky-black scales, the segments edged with pale golden bristles; first segment ochraceous, with dusky purplish-brown scales, the second segment with a median basal patch of cream-coloured scales, the third to fifth with basal crescentic bands of creamy scales, the sixth with just a few pale basal scales, remaining segments unbanded; the abdomen in some specimens has no basal banding, which may, however, have been denuded, although I do not fancy so; venter thickly clothed with creamy-yellow scales.

Legs with the coxae pale brown, with patches of white scales; femora with silvery-white scales below, black above; knee spot small; tibiae black, with a metallic bronzy lustre and long black bristles; metatarsi and tarsi deep bronzy-black; ungues all equal, and with a single tooth to each.

Wings with brown scales, the lateral ones being very long and slender; costa and first long vein very dark; first sub-



Fig. 263.

Wing of *Aedes fuscus* (♀).  
(X. 9.)



Fig. 264.

*Aedes fuscus*, O-Sacken (♂).  
(X. 9.)

marginal cell longer and narrower than the second posterior cell, its base very little nearer the apex of the wing than that of the latter, its stem equal to rather more than half the length of the cell, slightly shorter than the stem of the second posterior cell, which is nearly as long as the cell itself; posterior cross-vein not quite twice its own length distant from the mid cross-vein.

Halteres with a dull white stem and fuscous knob.

*Length.*—3·5 to 4·5 mm.

♂. Head black, with flat creamy scales on the occiput, a patch of purplish-black ones on each side of the occiput, then creamy ones, then a line of deep purplish-black ones, and then almost white ones at the sides, a few black upright forked scales on the nape; antennae banded; basal joint large, dark brown; second joint swollen, deep brown (Fig. 262, d); plumes dark chestnut-brown; proboscis dark brown to black; palpi minute, dark brown. Ungues of the fore and mid legs unequal, the larger one uniserrated; in the hind legs equal, and both toothed.

*Length.*—3 to 4·5 mm.

*Habitat*.—Ontario, Canada (Walker) (66); Massachusetts (Osten-Sacken).

*Time of capture*.—June, July, and September.

*Observations*.—Several females of this species received from E. M. Walker, who states that it is common on the borders of a marsh at High Park, Toronto.

As far as Osten-Sacken's description of *Aedes fuscus* goes, the Canadian species answers to it in all respects, but his description is very meagre. Osten-Sacken described *Ae. fuscus* in "Bull. U.S. Geological Survey," iii., p. 191 (♂ and ♀) from Cambridge, Massachusetts, having bred the species from larvae which he found in a pool, with those of several species of *Culex*. The larvae and pupae behaved just like those of *Culex*, but attracted attention on account of their smaller size.

It can easily be identified by the head ornamentation, as shown in the figure. The ♂'s are worn, and show no abdominal ornamentation, but the broad flat head scales are very distinct. This is the only true *Aedes* sent in any numbers from abroad.

Two ♀'s have more numerous golden-brown curved scales in the middle of the head than the rest, but the broad flat dark scales are still very prominent and distinct; some specimens have the basal abdominal banding more distinct than others, and with lateral expansions, but these are only varieties.

## 2. *AEDES* *OBSCURUS*. Giles. (Meigen MS.)

(Hd.Bk. Gnats or Mosq. p. 348. Giles (1900).)

Description of the type in the Jardin des Plantes by Lt.-Col. Giles :—

"A very uniformly coloured and dusky species; thorax and head dark brown, with the villosity of the same tint; the abdomen not very dark brown, with darker hinder borders to the segments; tarsi brown, unbanded; wings hyaline; first sub-marginal cell is narrower, but only a little longer than the second posterior and the stems of both are very long, that of the first sub-marginal being a trifle the longer; the super-numerary and middle transverse veins meet each other in an open angle pointing outwards; of the two the middle being much the longer, while the posterior transverse is longer still and placed a little internal to it."



3. *Aedes BUTLERI*. n. sp.

Thorax black, with small, dark, bronzy-black curved scales and black bristles. Abdomen black, with basal white lateral spots. Legs black; femora whitish beneath and at the base. Ungues of ♀ equal, the fore and mid uniserrated at the base; the hind ones equal and simple. Wings short, dusky, with dense dusky-brown fringe.

♀. Head black, covered with flat black scales (which have a dull bluish tinge under the microscope), some brownish ones behind, and with a thin row of white ones in the middle, a small spot of white scales on each side, and a very thin white border to the eyes; antennae brown, basal joint deep testaceous-brown, base of the second joint pale testaceous-brown; palpi short, covered with black scales with a purplish reflection; clypeus brown; proboscis black; eyes deep purple.

Thorax black, with small dark bronzy-black curved scales scattered over it, and with two rows of black bristles and numerous black bristles at the sides, especially over the root of the wings; scutellum black, with posterior border of black bristles and black scales; metanotum very dark brown; pleurae dark umber-brown to black, with four patches of white scales.

Abdomen black scaled, with basal white lateral spots to each segment.

Legs black, femora whitish beneath and at the base, knee spot small, white; unguis equal, the fore and mid toothed at the base, hind simple.

Wings short, slightly dusky, with dusky-brown scales and with a dense deep brown fringe; first sub-marginal cell much longer and a little narrower than the widest part of the second posterior cell, its stem equal to half the length of the cell, second posterior cell broadening out from the base, much shorter than the former, its base nearer the apex of the wing and its stem longer than the cell; posterior cross-vein twice its own length distant from the mid cross-vein; upper branch of the fifth long vein reaches the wing nearer the tip than the sub-costal does the costal.

Halteres with pale stem and dusky knob.

*Length*.—3·5 to 4 mm.

*Habitat*.—Selangor (A. L. Butler) (28. 10. 1899).

*Time of capture*.—September and November.

*Observations*.—Mr. Butler says this species is very common

and troublesome in Klang Jungle, and swarms in mangrove swamps. Three females only sent, no males.

I cannot find any description that will at all apply to this small black mosquito, which is evidently very abundant in the jungles of Selangor. Its intense blackness, with the white lateral spots (that do not show on the dorsum), the narrow triangular second posterior cell, should at once make its identity easy.

There is some slight variation, one species has the scutellum testaceous, in others the head ornamentation is more distinct, there appearing three clear pale lines, the lateral ones being oblique. Judging from the scale ornamentation, it is undoubtedly an *Aedes*.

#### 4. *Aedes nigricarpus*. n. sp.

Thorax black, with deep bronzy-black curved scales; abdomen black, with white lateral spots and white ventral bands; legs black; unguis of the ♀ equal and simple; wings smoky, with deep brown scales; stem of the first sub-marginal cell short.

♀. Head black, clothed with flat dusky scales over the occiput and pale smoky grey ones at the sides, with numerous black upright forked scales and long black bristles; eyes black and silvery; palpi short, dark brownish-black; antennae black, basal joint black, testaceous inside; proboscis and clypeus black.

Thorax black, densely clothed with a felting of narrow curved bronzy-black scales and two rows of black bristles and numerous black bristles over the roots of the wings; pleurae dark brown, with a few indistinct patches of grey scales; scutellum brown, with narrow curved bronzy scales and black "border-bristles."

Abdomen black, clothed with deep fuscous-brown scales, each segment with basal, lateral, white spots and brown posterior "border-bristles"; first segment black, with numerous long black bristles; venter black, with basal white scaled bands.

Legs black scaled; femora, especially of the fore legs, rather thick and bristly; coxae pale brown; unguis equal and simple.

Wings smoky brown; veins densely brown scaled; long scales on the stems of the second and fourth long veins; scales on both branches of the fork-cells and the third long vein dense, short and rather thick; first sub-marginal cell long, about five times the length of its stem, its base much nearer the base of the wing than that of the second posterior cell; stem of the latter equal to about two-thirds the length of the cell;

posterior cross-vein about twice its own length distant from the mid cross-vein.

Halteres with pale ochraceous stem and fuscous knob and part of the stem.

*Length*.—2 to 3 mm.

*Habitat*.—Itacoatiara, Lower Amazon (Austen) (96, 80).

*Time of capture*.—February.

*Observations*.—A small black species very like *Ae. Butleri*, mihi, but differing from it in two respects:—

(i) The fork-cells are relatively very much longer than in *Ae. Butleri*, in which the stem of the first sub-marginal cell is more than half the length of the cell, whereas in this species the stem is short;

(ii) There are numerous upright forked scales on the head, which do not appear to exist in *Ae. Butleri*.

Unless these two characters are looked for the species may easily be confounded, in spite of their widely separate habitats.

## 5. AEDES CINEREUS. Meigen (1818).

*Ae. rufus*. Gimmerthal (?) (1845).

(Syst. Besch. Europ. Zweiflügel. Insekt. i. 13, Meigen; Ins. Brit. Dipt. iii. Walker; Dipt. Scand. Zetterstedt; Fn. Austr. i. Schiner; Bull. Soc. Ent. Ital. (1896), p. 300, Ficalbi.)

(Fig. 96, Pl. XXIV.)

Thorax blackish-brown, with a faint median line with narrow curved golden scales. Abdomen black, with black scales, and with dull grey lateral ones, apical segment with white scales on each side at the base. Legs deep brown, with bronzy reflections, joints slightly testaceous. Ungues of fore and mid legs of ♂ unequal, the larger uniserrated, the smaller simple; hind unguis equal, simple, nearly straight.

♂. Head dark brown, covered with flat dusky ochraceous scales in front, some narrow ones behind, and black bristles projecting forwards; clypeus deep black; antennae banded grey and dark brown, basal joint large and rotund, deep shiny black, verticillate hairs dark brown; palpi very short, covered with black scales; proboscis very dark brown, becoming jet-black towards the apex.

Thorax blackish, with a faint median line, covered with scattered golden narrow curved scales; scutellum dark brown, slightly testaceous at the base and towards the sides, scales

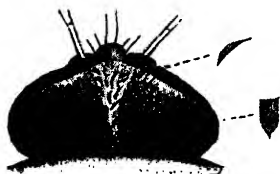


Fig. 265.

*Aedes cinereus*, Meigen.

Head of ♀ : b, scutellar ornamentation, and c', enlarged scale.

paler than on the mesonotum, curved and thin; metathorax blackish-brown; pleurae very dark brown, almost black, with a few white scales.

Abdomen black, covered with black scales and a few dull greyish lateral ones, the last segment with white scales on each side at the base; genitalia steely black, hairy, hairs brown.

Legs deep testaceous brown, covered with deep blackish-brown scales, with a rather bronzy reflection, the joints being slightly testaceous; fore unguis unequal, the larger one with a single tooth, the hind nearly straight and equal, simple.



Fig. 266.

*Aedes cinereus*, Meigen.

♂ fore and mid unguis.

Wings with the veins clothed with brown scales; the first sub-marginal cell longer and narrower than the second posterior cell, its stem not quite so long as the fork, its base a little (if at all) nearer the apex of the wing than the base of the second posterior cell, stem of the second posterior cell not quite so long as the fork, about the same length as the stem of the first sub-marginal; posterior cross-vein twice its own length distant from the mid cross-vein, sloping a little towards the base of the wing.

Length.—6 mm.

♀. Head covered with flat dusky black and dusky ochraceous scales on the occiput, with ochraceous narrow curved scales behind, and a few dark upright forked ones, flat ochraceous scales at the sides, and an indistinct pale border to the eyes; eyes purple and silver; antennae almost black, basal joint dark on the inside, testaceous on the outside, base of the second joint

testaceous; clypeus black; palpi short, but much longer than in the ♂, black scaled; proboscis deep testaceous, covered with deep purplish-black scales, jet-black at the apex.

Thorax deep chestnut-brown, with a paler median line dark on either side, covered with scattered golden-brown curved scales, and with three rows of black bristles on the mesonotum; scutellum ochraceous-brown, with pale spindle-shaped curved scales and with black border-bristles, very thick on the lateral lobes; metanotum bright pale brown; pleurae bright brown, with patches of white and yellow scales.

Abdomen apparently much as in the ♂.

Wings clothed with brown scales, the lateral ones long and thin, and truncated at the free end; first sub-marginal cell longer but about the same width as the second posterior cell, its stem not quite one-third less than the length of the cell, longer than the stem of the second posterior cell; the base of the first fork-cell nearer the base of the wing than that of the second posterior cell; posterior cross-vein twice its length distant from the mid cross-vein; fringe long, brown; scales at the root of the wing purplish-black, and the basal lobe of the wing with the fringe of dark scales very distinct, similar to the border scales of the fringe. Halteres ochraceous.

*Length*.—5·5 to 6 mm.

*Time of appearance*.—June (England).

*Habitat*.—England (Walker, Bradley, &c.), Norway and Sweden (Zetterstedt); Austria (Schiner); Italy (Rondani), &c.

*Observations*.—The following is Meigen's\* description of *Ae. cinereus* :—

“Diese einzige Art ist mehr braun als grau; Rückenschild röthlich behaart; Flügel ungeflekt; Schenkel blasser als alles Uebrige. Taster bei beiden Geschlechtern sehr kurz; sonst die übrigen Kennzeichen wie bei *Culex*, 2–2½ Linie. Dies ist alles was mir Herr Justizrath Wiedemann von dieser Art bemerkt hat, die ich weiter nicht kenne.”

The insect described by Gimmerthal in 1845 under the name of *Aedes rufus* is probably only the same as *Ae. cinereus*. It is described as “of a more redder tint than *Ae. cinereus*; proboscis brownish-yellow, with the extremity brown; palpi and antennae brown, the latter with the base yellow; thorax dorsally reddish-brown, with a darker median and two lateral lines very indistinct; legs yellowish; abdomen dark brown. *Length*.—5½ to 6 mm.”

\* Syst. Besch. Euro. Zweiflügel. Insekt. i. p. 13.

This was described by Gimmerthal from Russia, but until I see some Russian specimens I cannot say if it is synonymous with *Ae. cinereus* or a distinct species.

The ♀ *Ae. cinereus* has 2-jointed palpi and looks much like a *Culex*. The ♀ bites viciously.

#### 6. *Aedes perturbans*. Williston.

(?) *Wyeomyia Grayii*, mihi.

(Trans. Ent. Soc. Lond. (1896), p. 271.)

“♂ and ♀. Head black; antennae brown; plumosity of the male long, abundant and black; terminal joint as long as the seven or eight preceding it together, and clothed with short hair; in the female the joints are more slender, and the terminal one is not longer than the two preceding it taken together, the verticils of moderate length. Proboscis black, as long as the abdomen; palpi brown. Thorax yellow, the mesonotum a little darker and clothed with brown squamulae. Abdomen.

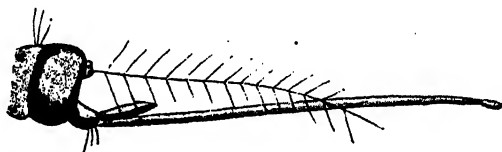


Fig. 267.

Head of *Aedes perturbans*, Will. (after Williston).

yellowish, brownish-yellow or brown, the terminal segments and the hypophygium brown or blackish; clothed above with brown squamulae. Legs brown or blackish, the femora for the most part yellow, and with a purplish or greyish reflection in some lights; in some specimens the tibiae are largely yellowish beneath the tomentum. Veins of the wings uniformly dark brown, squamulate.

*Length*.—4–5 mm.

*Eight specimens*.

*Habitat*.—St. Vincent.”

NOTE.—I rather fancy this may be my *Wyeomyia Grayii*. The description is not detailed enough to be certain, however, so I retain it as an *Aedes* until I see the type.

#### 7. *Aedes pembaensis*. n. sp.

Thorax blackish-brown, with two pale stripes on the front of the mesonotum, covered with spindle-shaped coppery-brown scales.

Abdomen dusky brownish-black, each segment with basal lateral white spots; basal segment deep ochraceous, with dark scales all over it; venter white scaled, with narrow apical dark borders. Legs dark brown; tarsi black; venter of femora white. Ungues of the ♀ equal and simple.

♀. Head blackish-brown, covered with flat blackish scales; eyes silver and black; antennae dark brown, with the basal joint brownish testaceous, and also the base of second joint bright testaceous; proboscis testaceous, covered with dark brown and black scales, and some with an ochraceous tinge; palpi very short, black scaled, with a few white ones at the tip.

Thorax deep blackish-brown, with two rather broad pale stripes in the middle in front, fading away halfway across the

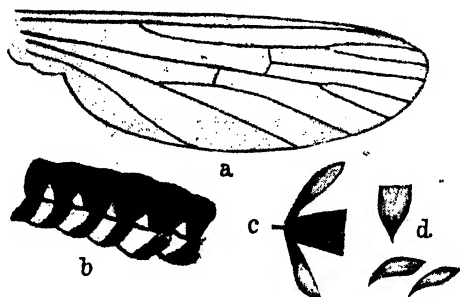


Fig. 208.

*Aedes Pempaensis*. n. sp.

a, Wing of ♀ (X. 10); b, side of abdomen; c, wing scales; d, head and scutellar scales.

mesonotum, covered with scattered spindle-shaped coppery-brown scales of a bronzy hue in some lights; just in front of the scutellum are some creamy-white scales and also a small patch just in front of each wing; metanotum black; pleurae dark brown, with four or five patches of white scales.

Abdomen covered with dusky brownish-black scales, with a basal white lateral spot on each side of the segments; the first segment deep ochraceous, with dark scales all over it; venter with white scales, except just at the apices of the segments; base of the abdomen testaceous; posterior borders of the segments with short golden bristles.

Legs dark brown, black towards the tarsi; coxae testaceous; ventral surface of femora white; bristles of the legs golden in some lights, brown in others; unguis equal and simple.

Wings with the veins covered with brown scales, the lateral ones long and narrow, but not nearly so long as in *C. pipiens* or *C. fatigans*. First sub-marginal cell about the same size as the second posterior cell, its stem not as long as the cell, a little longer than that of the second posterior cell, its base a very little nearer the apex of the wing than that of the second posterior cell; posterior cross-vein about two and a half times its own length distant from the mid cross-vein.

Halteres pale ochraceous.

Length.—4.5 mm.

Habitat.—Pemba Island, East Africa (Dr. R. O'Sullivan-Beare) (11. 10. 1899).

Time of capture.—August.

Observations.—Described from a single ♀. It is clearly an *Aedes*, but unless the scale structure is examined would probably be mistaken for a *Culex*.

#### 8. *AEDES NIGER*. n. sp.

Thorax dark brown; pleurae paler. Abdomen black, narrow. Legs dark brown, unbanded.

♀. Head dark brown, covered with flat dusky-brown scales, with three dark brown bristles projecting forwards and inwards on each side, and several paler brown median ones between the eyes; antennae rather pale brown, basal joint testaceous; palpi very minute, with deep brown scales; clypeus chocolate-brown; proboscis brown.

Thorax deep shiny black, with narrow curved hair-like bronzy-brown scales and long black bristles, paler at the roots of the wings; scutellum deep clear chestnut-brown, with narrow curved pale brown scales; metanotum deep chestnut-brown; pleurae pale brown, with dull grey scales and some black bristles, which on the front of the pleurae form a line of short comb-like appearance.

Abdomen narrow, black, covered with black scales, slightly testaceous at the base and apex; hairs of the posterior borders rather pallid.

Legs with the coxae and trochanters pallid, remainder dark brown, with black bristles; in some lights they have a dull ochraceous tinge; unguis very small and simple.

Wings with brown scaled veins, the median scales dark, in



a single row, truncated, the lateral scales paler, rather large and broad; fork-cells of moderate length, very nearly equal in length and breadth, the first sub-marginal a little the narrower; stem of the former about two-thirds the length of the cell, nearly equal to the stem of the second posterior cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein; fringe thick and long, brown.

Halteres with a white stem and black knob.

Length.—2 mm.

Habitat.—Old Calabar (Annett).

Time of capture.—April.

Observations. — Described from four ♀'s in Dr. Annett's collection. It is a very obscure species of dingy appearance. The general dusky hue and pale bases to the wings should, however, enable it to be easily identified amongst the West African *Culicidae*.

#### GENUS 17.—HAEMAGOGUS. Williston.

(Trans. Ent. Soc. Lond. (1896), p. 271.)

Head covered with flat scales, also the abdomen. Palpi short in both sexes, five-jointed, the first and fifth joints small, second long, nearly the same length as the third and fourth together, antennae fourteen-jointed. Wings with the two fork-cells rather short; scales normal, much as in *Aedes*. In the ♂ the front claws are unequal, and each with a single tooth, in the ♀ equal and simple.

This genus is related to *Aedes* on account of the ♂ and ♀ palpi being short in both sexes, but differs from it in the palpi being five-jointed. The only known species is metallic and brilliant in colour, differing in this respect from all others of the genus *Aedes*.

The single species, called by Williston *H. splendens*, occurs in St. Vincent and Brazil only, as far as our present knowledge goes, and nothing is known of its life-history. I feel certain that the *Culex cyaneus* of Fabricius, described from South America, is the same.

*HAEMAGOGUS CYANEUS*. Fabricius.*Culex cyaneus*. Fabricius.*Haemagogus splendens*. Williston.

(Syst. Antl. 35, 9, Fabricius; Dipt. Exot. p. 8, Wiedemann; Trans. Ent. Soc. Lond. (1896), p. 272 (= *splendens*), Williston.)

(Fig. 127, Pl. XXXII.)

Thorax deep blackish-brown, with deep metallic blue lustre, with brilliant green, coppery, and violet scales. Abdomen black, with brilliant blue and violet scales, the first five segments with basal lateral white spots forming more or less of a lateral white line. Legs metallic blue; hind femora pale golden on the basal half of the venter.

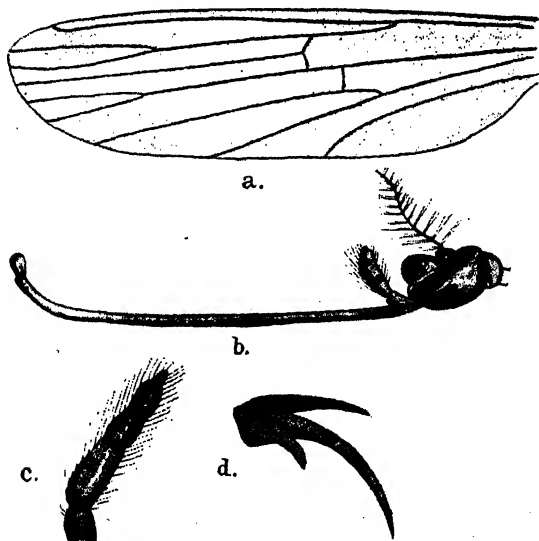


Fig. 260.

*Haemagogus cyaneus*, Fabr.

a, Wing of ♂ (X. 12); b, side view of head; c, palpus;  
d, ♂ fore unguis.

(a, b, and d, after Williston.)

♀. Head black, clothed with brilliant flat scales, those at the sides bright blue and white, those behind metallic green and blue; palpi covered with bright purple scales; proboscis long, deep violet-black; antennae dark brown, basal joint dark.

Thorax deep blackish-brown to deep blue; scutellum and metanotum also dark brown; mesonotum covered with brilliant green, coppery and violet scales; pleurae dark brown, with broad flat silvery white scales, very brilliant and shiny.

Abdomen black, covered with brilliant blue and violet flat scales; in some lights they look almost black, in others bright blue, in others with a violet tinge; the first five segments have basal lateral spots of pure white scales, which show as ten white spots on the venter as well, and appear more or less as a lateral line.

Legs with the coxae brown, remainder clothed with bright metallic blue scales, purple in some lights, dark brown in others; knee spot rather reddish; hind femora pale golden along the basal half of the venter, other femora with a small similar coloured spot at their base.

Wings covered with deep brown scales along the veins, with iridescent reflections in certain lights; first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem less than one-half the length of the cell; stem of the second posterior as long as its cell; posterior cross-vein about four times its own length distant from the mid cross-vein. Halteres with ochraceous-brown stem and fuscous knob.

*Length*.—5 mm.

*Time of capture*.—May.

*Habitat*.—St. Vincent (H. Powell) (10. 7. 1899, and Williston); Brazil (F. V. T.); South America (Wiedemann).

*Observations*.—This is seen to be a beautiful deep blue species when casually examined. Specimens have been received from St. Vincent and also from Brazil. Williston states that it is found at an elevation of 1000 feet at St. Vincent. The single male specimen he took was destroyed in drawing. No males have been received at the Museum. Four specimens only have been received from St. Vincent, all from the Convent Estate.

This species differs so much from a typical *Aedes* that Williston placed it in a new genus, *Haemagogus*, on account of the five-jointed palpi.

I have seen no ♂, but Williston describes it as "not differing from the female"; the ungues of the fore feet are unequal and uniserrated; he also figures the male wing, which is here reproduced.

*Synonymy*.—The species described by Williston under the name *Haemagogus splendens* is undoubtedly only Fabricius' *Culex cyaneus* from South America, the "lateral white lines on the abdomen" described by Fabricius being the lateral white spots which may appear confluent.

CULEX CYANEUS. Fabricius.

*Haemagogus splendens*. Williston.

(Syst. Antl. 35, 9, Fabricius; Dipt. Exot. p. 8, Wiedemann.)

"Blue, with a white line on the sides of the abdomen. Of the size and figure of *C. pipiens*. Head blue, proboscis black; thorax blue; abdomen flat, with lateral white lines. Legs very long, black, with copper-coloured tibiae. Antennae fuscous."—(Fabr.).

From Wiedemann it seems the abdomen is steel-blue, with white lateral lines, the venter and bases of the femora silvery.

*Length*.— $3\frac{1}{2}$  lines.

*Habitat*.—S. America.

## GENUS 18.—URANOTAENIA. Arribalzaga.

(Dipt. Argentina, p. 63.)

Closely related to *Aedes*, but usually more brilliantly coloured and stouter in form.

Palpi two-jointed, short in both male and female. Head clothed with flat scales, forked upright ones may or may not be present; antennae fourteen-jointed, pilose in the female,

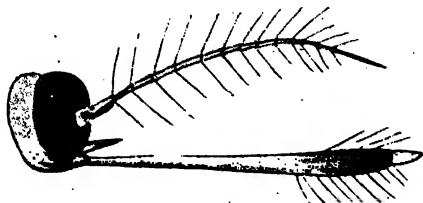


Fig. 270.

Head of an *Uranotaenia*.

plumose in the male; proboscis swollen at the apex, with hairs along the apical portion, especially prevalent in the male. Thorax clothed with narrow curved scales, and rows and patches of flat scales; scutellum with flat scales on the mid or lateral

lobes, or both. Abdomen densely clothed with flat scales, either banded or unbanded. Wings with very small fork-cells, with the veins clothed with single or double rows of small broad equilateral scales, abruptly truncated and with lateral clavate or elliptical scales to some of the veins (Fig. 272); on the roots of the wings are usually some flat scales of more or less brilliant hue; costal borders with lanceolate scales projecting from the edge (Fig. 272, b); first sub-marginal cell small, smaller than the second posterior cell, its base considerably nearer the apex of the wing than the base of the latter cell, its stem long, and its upper branch more or less closely applied to the first longitudinal vein (Fig. 272, 5); the sixth long vein curves at the apex, and the incassation in the anal cell is distinct, almost appearing as a true vein. The unguis of the female are simple and equal, whilst those of the male are unequal on the fore and mid legs.

This genus was founded by Arribalzaga for two South American species named by him *U. pulcherrima* and *U. Nataliae*. To these must be added the *Aedes saphirinus* of Osten-Sacken,

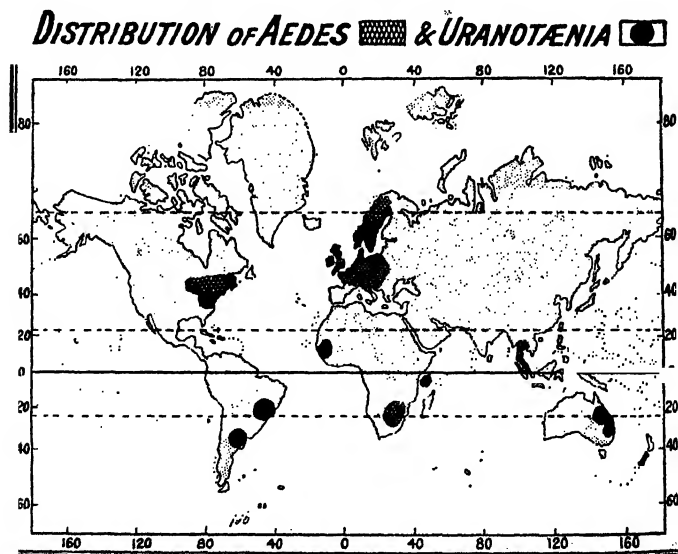


Fig. 271.

*Uranotaenia Trinidadensis*, *U. domestica*, *U. caeruleocephala* and *U. pygmaea*, mihi. Walker's *Culex argyropus* is also apparently an *Uranotaenia*, and (although not presenting the same thoracic and wing ornamentation of broad scales) the new species *minima*

and *Malayi*, mihi, must also be included in this genus, anyhow provisionally, until more material comes to hand, because of the squamate structure of the head and scutellum and the wing venation.

At present the distribution of the genus is as follows: South America, North America, Australia, New Zealand, India (?), Malay Peninsula (?), and West and Central Africa.

All that is known of the life-history of this genus comes from Dr. Lutz, who writes me that the larvae are like *Anopheles*, but lie slightly obliquely in the water. They are often brilliantly coloured, red, blue and green, and have a short respiratory tube. The adults sting generally in the daytime, but do not seem inclined to do so, and may be found in the grass near places where they breed.

## TABLE OF SPECIES.

A. Thorax ornamented with brilliant flat blue or white scales, in lines or spots.

a. Legs banded.

β. Thorax with blue flat scales.

(γ) Prothoracic lobes always blue scaled.

Thorax with median line of blue scales not reaching the scutellum *pulcherrima*.

Arribalzaga.

Thorax with a pale blue spot near the scutellum; abdomen with triangular pearly patches..... *geometrica*. n. sp.

Thorax with a pale blue median line reaching the scutellum; abdomen with pearly bands..... *saphirina*. Osten-Sacken.

Thorax ferruginous, with a patch of pale blue scales on each side in front only; scutellum with dusky scales..... *argyropea*. Walker.\*

(γγ) Thorax with white prothoracic lobes; chestnut-brown mesonotum, grey pleurae..... *annulata*. n. sp.

aa. Legs unbanded.

Thorax with pale blue spot in front of the roots of the wings and with a dark median line; abdomen with pearly basal bands ... *Nataliae*. Arribalzaga.

\* This species is only provisionally placed here.

Thorax with silvery-white spot on each side in front, one on each side just below and another at root of the wings; scutellum white scaled ..... *domestica*. n. sp.

AA. Thorax ornamented with brilliant flat white scales in lines.

Thorax black, with a line of flat white scales in front of each wing root, and flat white scales on the prothoracic lobes ..... *pygmaea*. n. sp.

Thorax similar to above; head azure-blue ..... *caeruleocephala*. n. sp.

Thorax blackish to bronzy, white behind head and in front of the wings; abdomen with basal white lateral spots ..... *Malayi*. n. sp.

Thorax rufous, with white scales in front of the wings; second long vein much curved, close to first long vein..... *Mashumataensis*. n. sp.  
(Position in table doubtful.)

Legs banded.

Thorax denuded; abdomen with basal pale yellowish-brown scales; legs with apical and basal pale banding; very small..... *minima*. n. sp.

# 1. URANOTAENIA PULCHERRIMA. Arribalzaga.

(Dipt. Argentina, p. 65 (pl. iv. fig. 4).)

(Fig. 128, Pl. XXXII.)

Thorax bright testaceous, with a median pale blue line in front not reaching the scutellum, a pale blue patch on each side of the wings, another on the scutellum, and deeper blue on the prothoracic lobes. Abdomen dusky brown, with whitish cross bands, rather irregular. Legs brown, with apical white rings on the tibiae and tarsi, last hind tarsus all white.

♀. Head clothed with flat scales, of a dark brown and deep ochraceous brown colour on the occiput, a small blue patch on each side close to the eyes, behind are short black upright forked scales; antennae brown, with narrow pale rings, basal joint bright pale reddish-ochraceous; proboscis and palpi black, the latter very small, the former expanded towards the tip.

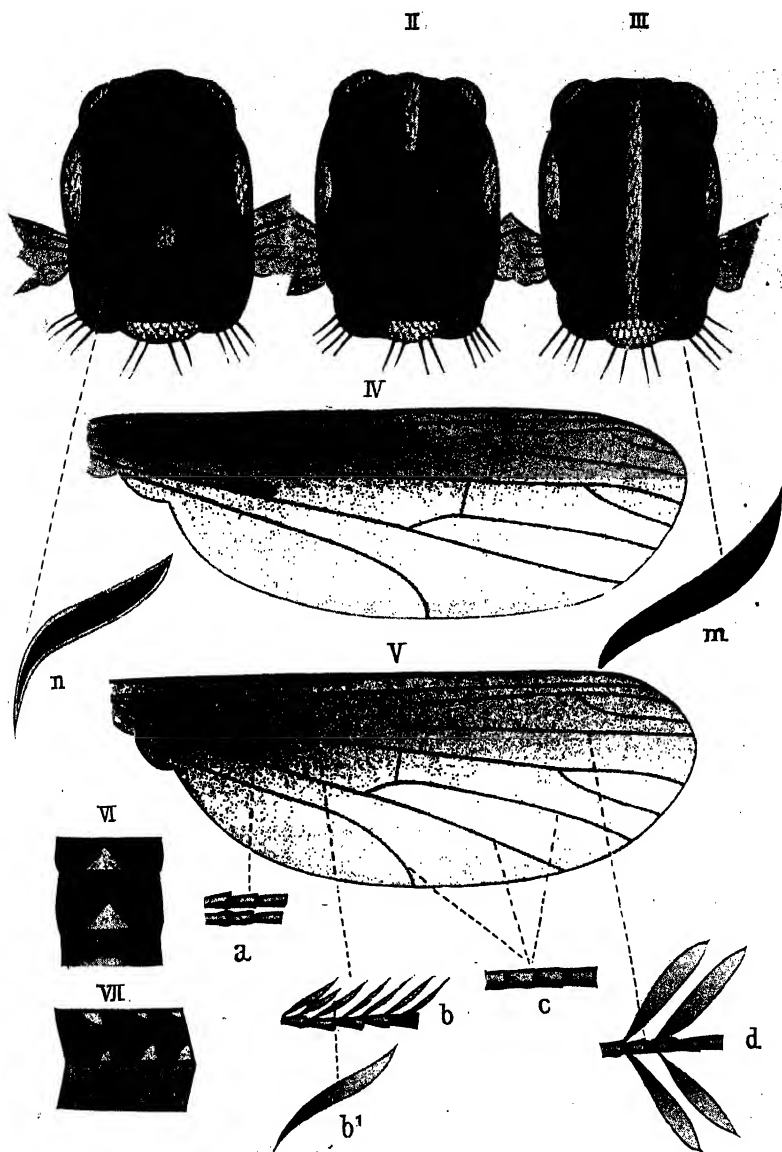


Fig. 272

*Uranotaeniae*.

- I. *Uranotaenia geometrica*, n. sp.; II. *Uranotaenia pulcherrima*; III. *Uranotaenia sapphirina*; IV. wing of ♀ *Uranotaenia geometrica*; V. Wing of ♀ *Uranotaenia pulcherrima*; VI. and VII. abdominal segments of *Uranotaenia geometrica*; n, thoracic scale of *Uranotaenia geometrica*; m, of *Uranotaenia sapphirina*; a, b, b', c, and d, scales of wing.



Thorax bright testaceous brown, with narrow bronzy-black rather straight scales, scattered over the surface, a median line of small, flat, brilliant blue scales ending about or just before the middle of the mesonotum; another patch just before the roots of the wings, more or less in the form of a line; prothoracic lobes densely covered with deep blue flat scales; on the mesonotum are also two median rows of long bristles and there are others at the sides, in some lights two parallel paler lines follow these two lines of bristles; scutellum pale testaceous at the sides; middle lobe darker, covered with flat blue scales and with four border bristles, side lobes also with four bristles; metanotum pale ochraceous-brown; pleurae pale ochraceous, with a dense patch of flat bright-blue scales over the anterior legs.

Abdomen dusky brown to almost black, the segments, especially the apical ones, with apical pearly-white borders, more or less irregular, and with clear white apical lateral spots.

Legs with the coxae pale ochraceous; femora dark brown above, pale beneath; tibiae black, with a white apical spot; fore metatarsi and first tarsal joints with a small white apical band, the remainder brown; mid legs much the same; hind legs with all the tarsi with apical white bands, except the last, which is *entirely white*; ungues equal and simple, rather thin.

Wings with the veins with a single median row of dark brown spatulate scales and with lateral clavate and broadly lanceolate ones on the first, second, third, and on the fork of the fourth, some rather elongate, others with thin pedicils; at the base of the fourth and fifth long veins is a line of brilliant mauve scales; fork-cells short, the first sub-marginal cell much smaller than the second posterior cell, its base nearer the apex of the wing, and its upper branch close to the first long vein, also its stem, which runs parallel and almost touching it; the stem just at the root of the fork has a few large pedunculate lateral scales; supernumerary cross-vein close to the end of the second long vein; second posterior cell larger than the first sub-marginal cell, its stem rather more than one-and-a-half times the length of the cell; posterior cross-vein not quite its own length distant from the mid cross-vein, close to the base of the fork of the fifth; no scales at the tip of the sixth vein, which is much curved at the apex. Halteres with an ochraceous stem and dusky knob.

*Length*.—2 to 2.7 mm.

♂. The proboscis in the ♂ has short hairs on its apical half, and is testaceous, with the apex black (Arribalzaga).

*Habitat*.—Buenos Ayres (Arribalzaga); Sao Paulo (Dr. Lutz).

*Observations*.—Through the kindness of Dr. Lutz I have been enabled to examine a specimen of this beautiful little species, which may be taken as the type of the genus. The broad scales on the thorax are brilliant pale blue, and can easily be seen with the naked eye. This species can at once be told from its neighbours, *U. geometrica* and *U. saphirina*, by the mid thoracic blue line ending abruptly before the scutellum.

Arribalzaga described this species from the Argentine. Dr. Lutz has only met with it, so he informs me, in one locality at Sao Paulo, so that it may be a local species, and at present is only known to occur in South America.

## 2. URANOTAENIA GEOMETRICA. n. sp. (Lutz MS.)

(Fig. 129, Pl. XXXIII.)

Thorax testaceous brown, with two more or less distinct paler parallel lines, covered with scattered thin bronzy-brown scales, with a light blue line before the roots of the wings, a spot in the middle near the bare space in front of the scutellum, and another blue spot on the mid scutellar lobe and pale blue prothoracic lobes, and also two blue spots on the head. Abdomen black, with apical median triangular white patches. Legs blackish, with apical white bands, the *last two hind tarsi being all white*.

♀. Head covered with flat black scales, rather ochraceous behind, and with brilliant blue ones at the sides and along the eyes; antennae brown, basal joint and base of the second joint bright clear yellow; palpi very small, brown scaled; clypeus deep rich brown, shiny; proboscis as long as the whole body, swollen at the apex, brown at the base, dull metallic green, then purple at the apex.

Thorax bright testaceous brown, with two paler parallel lines, somewhat darker between than at the sides, covered with scattered narrow deep bronzy scales, which under the microscope present a beautiful appearance; the middle of the scales appears as a dark line bordered with a narrow golden rim; in front of the roots of the wings is a long patch of brilliant pale

blue flat scales, another exists in the middle line just before the bare space in front of the scutellum ; there are also two rows of brown bristles ; prothoracic lobes covered with flat bright blue scales ; scutellum with a patch of flat blue scales to the middle lobe ; narrow bronzy ones to the lateral lobes ; four bristles on the median lobe and four on each of the lateral lobes like *U. pulcherrima* ; pleurae pale bright testaceous, with one large patch of pale blue flat scales and traces of a second smaller one, and with scattered brown bristles ; metanotum pale yellowish-brown.

Abdomen steely-black, covered with dusky-black scales, the third to eighth segments with a median apical white triangular spot, the base of the triangle level with the posterior border of the segments, these spots show pale blue and pearly reflections in some lights, the posterior borders with small pale hairs ; there are also pearly apical lateral spots ; venter pale scaled.

Legs with the coxae very pale ochraceous, with a few dark brown and pale golden bristles ; bases and venter along the basal half of the femora pale ochraceous, apical half dark brown, with a pure white apical dorsal spot ; fore tibiae, metatarsi and tarsi dark brown, the apex of the tibiae and metatarsi with a small white band, traces of the same on the apices of the first three tarsi ; mid legs similar in colour to the fore legs, but the femora much enlarged, hind legs with the tibiae with a large white apical patch, metatarsi and first tarsal joint with a small white apical band, the second tarsal with a broad white apical band, the last two joints being pure white ; ungues equal, thin and simple.

Wings with dark- and pale-brown scales, those on the veins spatulate, short and rather broad, single rowed, the lateral ones, where they occur, pale, lanceolate and large ; the costal border dark, with fine pointed narrow lanceolate scales along its free border ; scales on the first, second, third, fifth and sixth longitudinals dark brown, those on the fourth pale brown, except at the fork, the root of the fifth is densely scaled with blue scales, with pale mauve reflections, forming a distinct blue line ; on the fork-cells and on all the third vein are large lateral pale lanceolate scales ; there is a very distinct incrassation forming a quasi-seventh vein ; first sub-marginal cell much smaller than the second posterior cell, lying close to the first longitudinal vein, but its stem not so near as in the former species (*pulcherrima*) ; the stem three times as long as the cell ; the junction of the

supernumerary and mid cross-veins close to the base of the vein, but not nearly so close as in the former species; posterior cross-vein not quite its own length distant from the mid cross-vein. Halteres with a deep ochraceous stem and fuscous knob.

*Length*.—2.5 mm.

*Habitat*.—Cubatao, near Santos, Brazil (Dr. Lutz).

*Observations*.—Dr. Lutz sends me an *Uranotaenia*, which he points out as differing from *U. pulcherrima* of Arribalzaga, and which he names *geometrica*. After carefully studying the two specimens sent and comparing them with *U. pulcherrima*, I feel convinced that Dr. Lutz is correct, although it is closely related to Arribalzaga's species. Dr. Lutz pointed out to me that the abdominal ornamentation differs, and also that the leg banding differs, the two last tarsal joints of the hind legs being pure white, whilst in *pulcherrima* the last only is white, the abdominal ornamentation consists of apical triangular median white patches, not bands, as in *U. pulcherrima* (Fig. 272, VI. and VII.). To these differences I must add the following: (i) there is no median blue thoracic line, but a blue median spot towards the scutellum; (ii) the dark thoracic scales have a golden border when seen under the microscope, whilst in *U. pulcherrima* they are all deep bronzy-brown, like *saphirina* (Fig. 272, I., n, and III., m); (iii) the first sub-marginal cell is relatively much smaller than in *U. pulcherrima*; (iv) the basal blue-scaled line of the wings is present only on the root of the fifth vein, whilst in *U. pulcherrima* it is on both the fourth and fifth veins; (v) lastly, I can detect no upright forked scales on the head of *U. geometrica*.

I have not seen a ♂. Dr. Lutz says they breed with *Anopheles*, and the larvae are much like those of that genus, but have a short respiratory tube, and lie obliquely in the water. They sting severely in the daytime, but do not seem very inclined to do so. They may also be found in the grass near the places where they breed.

### 3. URANOTAENIA SAPHIRINA. Osten-Sacken.

*Aedes saphirinus*. Osten-Sacken.

(Trans. Ent. Soc. Ameri. vol. ii. p. 47.)

Thorax tawny-brown, paler on the pleurae, with a metallic blue median mesothoracic line reaching the scutellum, a pale blue line in front of the wings, and two blue spots on the pleurae.

Abdomen brownish above, pale below, with pale apical bands. Legs brownish, with white dots on the apices of the femora and tibiae (probably banded on the tarsi).

Head with blue scales along the eyes, especially in the middle; antennae blackish, basal joint tawny; proboscis long.

Thorax brownish-tawny, darker above, paler on the pleurae, with a metallic blue longitudinal median line reaching to the scutellum, a short blue line in front of the wings, and two blue spots on the pleurae (Fig. 272, III.).

Abdomen brownish above, paler below, with apical pearly bands.

Legs brownish, paler at the base, a snow-white spot on the upper side of the femora and tibiae, which appear pale bluish when looked at obliquely; tibiae and tarsi also show a light bluish reflection.

Wings with brown scales, which show blue reflections, especially a stripe near the base between the third and fourth longitudinal veins.

*Length.*—2.5 mm.

*Habitat.*—United States, at Washington, Brooklyn (O.-Sacken); Ithaca (Howard).

*Observations.*—Described by Osten-Sacken, evidently from denuded specimens. Howard figures the species ("Notes on Mosquitoes of the United States," Bull. 25, N.S., Fig. 22), and shows the abdomen to be banded, but I cannot see any banding marked on the tarsi. The species is clearly distinct, and can be told by the median pale line running down to the scutellum, a character which evidently separates it from both *U. pulcherrima* and *U. geometrica*.

#### 4. URANOTAENIA ANNULATA. n. sp.

Head creamy-white. Thorax chestnut-brown, pleurae grey, sharply separated from the brown dorsum. Abdomen black, with apical grey bands. Legs brown, fore and mid unbanded, hind with apical whitish bands, last two tarsi all whitish.

♀. Head covered with flat creamy-white scales all over, except just in the middle, where there is a dark line of scales; with a few upright ochraceous forked scales, which are rather darker towards the nape; a few large dark brown bristles projecting inwards in front of the head; antennae dark brown,

basal joint partly deep testaceous; palpi very minute, deep brown; proboscis deep brown; the whole head is very small.

Thorax (Fig. 273, a and b) deep brown, with small narrow hair-like curved bronzy scales, a double median row of deep black bristles bending out laterally, and lateral rows of the same; prothoracic lobes densely covered with flat creamy scales; scutellum paler brown, with small deep brown, almost black, flat scales on the mid and lateral lobes, and with long deep brown border bristles, three very long ones to each lateral lobe; metanotum deep brown; pleurae pale grey, the dark colour of the dorsum extending into the pleurae, where it meets with the pale grey area as a sharply defined straight line.

Abdomen nearly black, with narrow apical grey bands and small pale border-bristles.

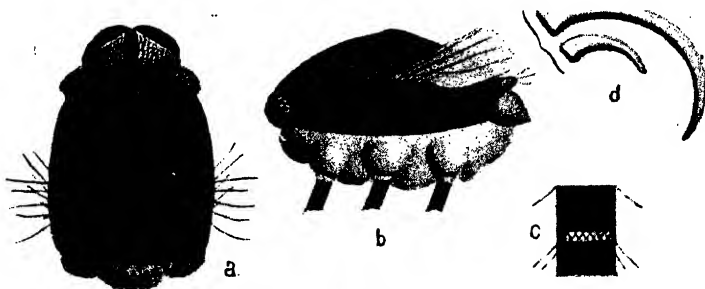


Fig. 273.

*Uranotaenia annulata*. n. sp.

a, Head and thorax; b, lateral view of thorax; c, abdominal ornamentation; d, ♂ unguis (fore).

Legs with the coxae and trochanters very pale yellowish-grey, remainder deep brown on the fore and mid legs, with traces of a paler knee spot, and somewhat ochraceous beneath the metatarsi and tarsi; hind legs with the femora pale yellowish beneath at the base, knee spot more distinct, the apex of the metatarsi and first two tarsi with a narrow white ring, last two tarsi pure creamy-white; unguis very small, equal and simple.

Wings with the fork-cells very small, the first sub-marginal much smaller than the second posterior cell, its base much nearer the apex of the wing than that of the latter; posterior cross-vein considerably longer than the mid, about half its length distant from it; scales as in a typical *Uranotaenia*, but the lateral scales of the veins rather broader in places and shorter than in the N. and S. American species.

Halteres ochraceous, with a dusky knob.

*Length*.—2·5 to 3 mm.

♂. Very similar to the ♀. Antennae grey, with brown bands at the verticils, hairs brown; basal joint large, globular, testaceous; palpi very small, dark brown; proboscis brown, expanded as in the ♀; unguis (Fig. 273, d) of the fore and mid legs very unequal, sickle-shaped, simple, the smaller one not so curved as the larger; hind unguis equal and simple.

Venation very similar to that of the ♀. On the prothoracic lobes, which are white, are a few long brown bristles.

*Length*.—2·8 mm.

*Habitat*.—Bonny (Annett).

*Time of capture*.—May.

*Observations*.—Described from two ♂'s and seven ♀'s in Dr. Annett's collection. It is a very distinct *Uranotaenia*, easily told by the apical abdominal banding and the very distinct and contrasted dark brown and grey sides. The head seems very small and much tucked under the thorax; even for an *Uranotaenia*.

## 5. URANOTAENIA NATALIAE. Arribalzaga.

(Dipt. Argentina, p. 64.)

Thorax dark fawn, with a darker median line; a long pale blue spot on each side in front of the wings; prothoracic lobes blue. Abdomen black, with pearly bands. Legs testaceous at the base, tarsi darker, unbanded.

♀. Head testaceous, clothed behind with pale blue scales; palpi deep piceous; proboscis piceous, brown at the base, with short fuscous pilosity; eyes black, with a silvery border.

Thorax dark fawn, darkest in the middle; on each side in front of the wings is a long blue-scaled patch; prothoracic lobes blue scaled; pleurae pearly.

Abdomen piceous, testaceous at the base, with pearly bands.

Legs pale testaceous, with the apices of the femora, tibiae and tarsi dark brown.

Wings limpid, with fuscous scales, which appear pale blue in places. Halteres pale reddish, with the knobs fuscous.

♂. The ♂ has the apical half of the proboscis with long fuscous hairs.

*Length*.—2 to 2·5 mm.

*Habitat*.—Buenos Ayres (Arribalzaga) ; Sao Paulo (Dr. Lutz).

*Observations*.—The above description is partly compiled from Arribalzaga's work. Specimens were sent me by Dr. Lutz, but were much damaged in transit, so I have been unable to completely redescribe this species in uniformity with the rest.

It seems to be chiefly distinguished by the unbanded legs and the absence of any blue ornamentation in the middle of the mesonotum.

Dr. Lutz tells me it occurs in the littoral zone in Brazil, but only sparingly.

#### 6. URANOTAENIA DOMESTICA. n. sp.

Thorax bright reddish-brown, a small metallic silvery spot on each side in front, three silvery spots on the scutellum. Abdomen dark brown, with lateral silvery spots. Legs almost black, a silvery spot near the apex of the hind femora and one also at the apex, and another on the apex of the tibiae.

♀. Head dark brown, covered with dark brown flat scales, a patch of silvery-white ones on each side near the eyes, towards the middle, and a patch of dull ochraceous ones laterally ; at the back of the head is a patch of dull ochraceous narrow curved scales, and projecting forwards numerous black bristles ; proboscis almost black ; palpi very small, black and scaly ; antennae brown, with black hairs, basal joint deep shiny brown and testaceous.

Thorax (Fig. 274, a) bright reddish-brown, covered with very small curved hair-like bronzy-brown scales ; on each side of the

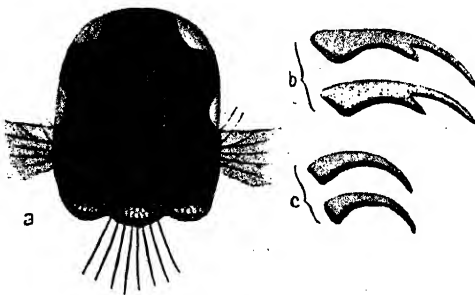


Fig. 274.

*Uranotaenia domestica*. n. sp. (♀).

a, Thoracic ornamentation ; b, fore unguis ; c, hind.

mesothorax in front is a silvery-white spot of rather flatter scales, and another rather larger just in front of the roots of



the wings below, and one at the root of the wings; scutellum with three patches of flat white scales and black border-bristles, eight unequal sized ones to the mid lobe; pleurae chestnut-brown, with a white patch; metanotum chestnut-brown.

Abdomen steely-black, with blackish-brown scales, laterally with silvery-white basal spots; venter dark scaled, with rather short pale hairs; the lateral spots are not always quite basal.

Wings rather dusky-brown; veins clothed with brown scales, the lateral ones rather long and broad; first sub-marginal cell a little longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the second posterior cell; posterior cross-vein about its own length distant from the mid cross-vein; a pure, not very white, spot at the base.

Legs deep brownish-black, apex of the fore and mid femora with a minute white patch or spot, which is much larger in the hind legs, hind femora with a silvery spot also near the apex, and yellow scaled ventrally; tibiae also with an apical silvery-white spot, which is very large in the hind legs, moderate in the fore, and almost absent in the mid legs; unguis of the fore and mid legs equal and uniserrated, equal and simple in the hind pair.

Halteres ochraceous-brown, with a black scaled knob.

*Length*.—3.8 mm.

*Habitat*.—Old Calabar (Annett).

*Time of capture*.—April.

*Observations*.—Described from three ♀'s in Dr. Annett's collection. They were all taken in the Vice-Consulate at Old Calabar, and so appear to be more or less a domestic species. It has a very distinct thoracic ornamentation, and cannot readily be confused with any other *Uranotaenia* I have yet seen.

#### 7. URANOTAENIA PYGMAEA. n. sp.

Thorax black, covered with narrow shiny pale bronzy scales, with a short clear silvery-white line on each side just in front of the wings, another small white spot on the prothoracic lobes and others on the pleurae. Abdomen dusky brown; pale cream-coloured bands along the apical borders—these are sometimes indistinct; venter grey. Legs deep purplish-black to dull black, coxae, bases and venter of femora pallid. Wings with purplish-black scales and with a line of silvery-white scales at the base.

♀. Head dark brown, with broad flat scales, black in the middle, and with a few black upright forked ones and flat white ones in front, forming a very distinct white broad border to the eyes, which widens out laterally, forming a pale violet-coloured patch on each side; two black bristles project forwards from between the eyes and others are placed laterally; eyes black; antennae brown, basal joint deep ferruginous in some lights, brown in others, base of the second joint also ferruginous; palpi very short, black; proboscis dark brown, nearly as long as the body, expanded apically, hairy.

Thorax black, covered with narrow shiny pale bronzy scales and black bristles; a distinct line of flat brilliant silvery-white scales in front of the wings, on each side; also a small silvery-white patch on each prothoracic lobe, and others on the pleurae; scutellum almost black in some lights, testaceous at the sides in others; metanotum dark reddish-brown; pleurae brown, spotted with white; in some lights the thorax looks deep umber-brown under a hand-lens.

Abdomen clothed with dusky-brown scales, with dull violet reflections, pale cream-coloured bands along the apical borders, giving the abdomen a distinctly banded appearance, apical borders of the segments with brownish-golden hairs (in some specimens this banding is not at all distinct); venter covered with grey scales; in some specimens there are pale apical patches on the sides, but not in all.

Legs covered with purplish-black scales; coxae, bases and ventral surfaces of the femora pallid, grey scaled; hind legs with a faint knee spot; the whole legs have a bronzy appearance in certain lights.

Wings with the veins covered with purplish-black scales, except the base of the fifth longitudinal vein, which is covered with silvery-white scales, forming a characteristic silvery line at the base of the wing; wings iridescent; first sub-marginal cell very small, both shorter and narrower than the second posterior cell, its stem more than twice the length of the cell;

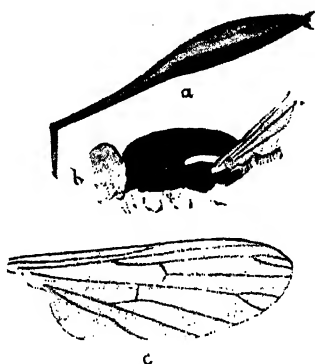


Fig. 275.

*Uranotaenia pygmaea*. n. sp.

a, Mid femora of ♀; b, side view of the thorax; c, wing of the ♀.

second posterior cell broad, its base nearer the base of the wing than that of the first sub-marginal cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein, both very pale; veins with a row of small dark scales; the apical portions of the second to fourth long veins with lateral spindle-shaped ones; halteres with a pale stem and fuscous knob.

*Length*.—2 mm.

*Time of capture*.—July.

*Habitat*.—Bupengary, Queensland (29. 5. 1899).

*Observations*.—A very distinct species, with very characteristic silvery markings, notably on the base of the wings in front, on the prothoracic lobes, and on the wings themselves. In many respects it might be mistaken for *C. atripes* of Skuse, but the first sub-marginal cell is quite different from Skuse's *C. atripes*. One specimen resembles the one from which this description was taken, but the white markings are absent. I cannot, however, see sufficient characters to separate it. Although there are certain striking resemblances to *C. atripes*, the first sub-marginal cell is narrower and shorter instead of *much longer and scarcely narrower* than the second posterior cell. The apical abdominal banding is not mentioned by Skuse, and the still more striking silvery-white line on the wings could not have escaped his observation. This small species is undoubtedly a typical *Uranotaenia*, most nearly approaching Arribalzaga's *U. pulcherrima*, but instead of having *blue* flat scales, as one finds in the South American species, the scales are brilliant white as in the African *U. caeruleocephala* and *U. domestica*.

#### 8. URANOTAENIA CAERULEOCEPHALA. n. sp.

Head with shiny azure-blue scales. Thorax chestnut-brown, with a small silvery-white spot on each side in front, a white line on each side just in front of the wings. Abdomen and legs brown, unbanded.

Head covered entirely with flat azure-blue scales, slightly paler around the eyes, and with black upright forked scales behind, the apices of the forks bent (Fig. 276); a large lateral black bristle on each side curved inwards, two smaller ones in the middle, and two nearly parallel small ones between the eyes pointing-forwards; antennae brown, with rather large joints; basal joint deep brown; proboscis brown; palpi black, very minute.

Thorax deep chestnut-brown, with narrow curved hair-like bronzy scales and long black bristles, on the prothoracic lobes are flat shiny white scales, forming two spots, and a silvery-white line on each side in front of the wings; scutellum deep testaceous in the middle, black on each side, with black border bristles and numerous flat black scales; metanotum dark brown; pleurae paler brown (one specimen shows a large patch of flat white scales).

Abdomen blackish-brown to deep black, slightly paler at the apex, with paler hairs.

Legs unbanded, deep brownish-black, the apical tarsi with a paler ochraceous tinge, especially beneath; unguis very minute, equal and simple.

Wings with the costal border dark brown, veins light brown; the scales on many of the veins confined to a middle row of

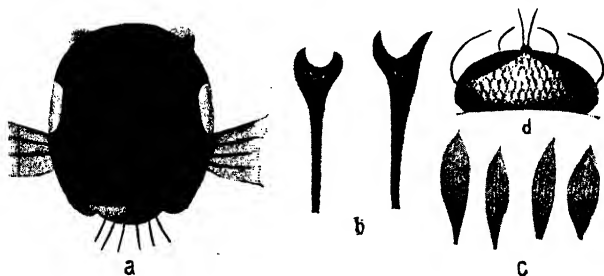


Fig. 276.

*Uranotaenia caeruleocephala*. n. sp.

a, Mesothorax and scutellum; b, upright forked scales of head; c, thoracic and wing scales; d, head.

small truncated ones only, the lateral ones where present rather large, with narrow stems (Fig. 276); the fork-cells and the whole of the third longitudinal clothed with large lateral scales; venation very similar to other species, but the posterior cross-vein, which is longer than the mid cross-vein, is rather more than its own length distant from it; fringe dense brown.

Halteres with a white stem and black knob.

Length.—2.3 to 2.5 mm.

Habitat.—Old Calabar (Annett).

Time of capture.—April.

Observations.—Described from eight ♀'s in Dr. Annett's collection. They are all similar, except that one specimen shows a very marked lateral white spot, composed of flat white scales on the mesopleura. It is a very distinct species, easily

identified by the pale azure-blue head, unbanded legs and abdomen, and the white lateral line in front of each wing. The black bristles by the roots of the wings present in some specimens a marked "fan-shaped" arrangement. The labels bear "Taken in 'Force Mess,' Old Calabar." The upright forked scales of the head are also peculiar in form (*vide* Fig. 276).

9. *URANOTAENIA MALAYI*. n. sp.

Thorax black, with flat bronzy spindle-shaped scales, with some white ones just behind the head and in front of the roots of the wings. Abdomen dusky blackish-brown, with small triangular basal lateral white spots. Legs black; knee spot pale; unguis of the female equal and simple.

♀. Head clothed with flat black scales, with a few grey ones forming a pale central line, a border of creamy-white scales round the eyes and at the sides, a few small black upright scales at the back of the head; a few black bristles projecting in front; antennae brown, basal joint almost black, pubescence and hairs blackish, each joint with narrow dark ring, from whence the

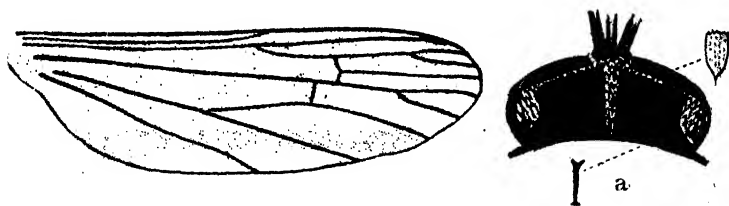


Fig. 277.

*Uranotaenia Malayi*. n. sp.

Head (a) and wing of ♀.

verticillate hairs arise; palpi black scaled and with black bristles; proboscis dark brown, with short blackish bristles; eyes black.

Thorax black, with scattered bronzy flat spindle-shaped scales, some white ones just behind the head and at the sides in front of the wings; numerous dark brown and black bristles over the roots of the wings; scutellum paler, clothed with flat dark scales in the middle, and on the lateral lobes, with apparently five dark brown central bristles and other lateral ones; metanotum deep chestnut-brown, with a purplish tinge; pleurae purplish-black and brown, with white scales.

Abdomen covered with dusky blackish-brown scales and with short pale hairs to the posterior borders of the segments; laterally there are small triangular basal white spots, most distinct on the last few apical segments.

Legs black, coxae brown, knee spot pale, ventral surface of femora pale; ungues equal and simple; hind metatarsi equal in length to the hind tibiae.

Wings with the veins sparsely clothed with brown scales; first sub-marginal cell shorter and narrower than the second posterior cell, its stem longer than the cell; base of second posterior cell nearer the base of the wing than that of the former, its stem equal in length to the cell; both cells very short; posterior cross-vein about its own length distant from the mid cross-vein. Halteres with pale ochraceous stem and fuscous knob.

*Length*.—3·8 mm.

*Habitat*.—Selangor (A. L. Butler, 28. 10. 1899).

*Time of capture*.—September.

*Observations*.—A single ♀ specimen only obtained by Mr. Butler in Klang jungle. A rather obscure dark species, but with characteristic wing venation, the two fork-cells being very small, the first sub-marginal particularly so; this and the scale structure of the head and scutellum place it in this genus.

#### 10. URANOTAENIA MASHONAENSIS. n. sp.

Thorax bright rufous, pleurae pale dull creamy-yellow. Abdomen dark brown. Coxae pallid; legs brown. Ungues of the ♀ equal and simple, small; the middle ungues of the ♂ very unequal, simple, the larger much curved; hind ungues equal and simple. A variety occurs with some apical bands on the abdomen and white scales on the pleurae.

♀. Head dark brown, clothed with flat dusky brown scales and some creamy-yellow ones forming lateral patches; clypeus ferruginous; proboscis dark brown, much expanded apically; antennae dark brown, pale brown in certain lights; eyes black and silvery; palpi dark brown, very small.

Thorax reddish or chestnut-brown, shiny, with small scattered dull brown scales closely applied to the surface, and black bristles; there also seem traces of dusky longitudinal lines on the mesonotum; scutellum bright brown, with narrow curved deep brown to almost black scales; mid lobe with four border

bristles, each lateral lobe with three large ones and one small bristle; metanotum chestnut-brown, darker at the sides; pleurae and prothoracic lobes pale dull creamy-yellow to pale ochraceous, with rows of long black bristles going down to the coxae.

Abdomen steely-black when denuded, covered with dusky black scales, with short posterior border-bristles and lateral dark brown bristles; first segment dull ochraceous, with black scales.

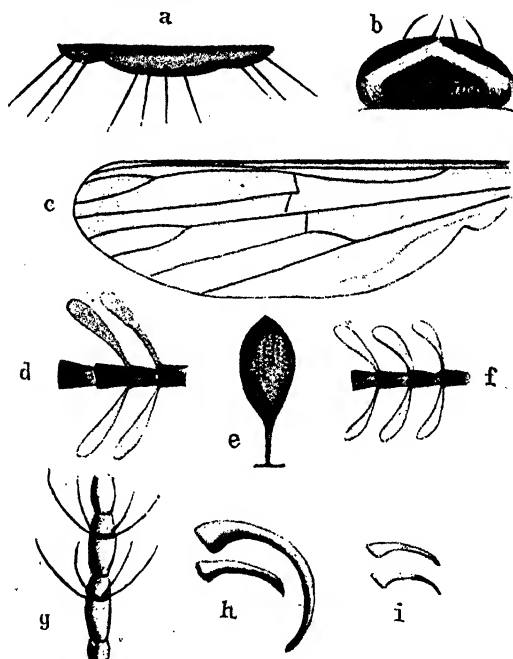


Fig. 278.

*Uranotaenia Mashonaensis*, n. sp.

a, Scutellum; b, head; c, wing of ♀; d, wing scales; e, enlarged scale; f, two antennal joints; g, fore, h, hind legs; i, hind ungues.

Legs long, brown, with the coxae very pale ochraceous, almost creamy-white, and with a row of black bristles on their outsides, remainder of the legs covered entirely with small brown scales; ungues very small, equal, and simple.

Wings with the veins clothed with a median row of rather short thick brown scales and short and moderately long lateral clavate ones; first sub-marginal cell shorter than the second posterior cell, its base nearer the apex of the wing, about the

same width, its stem and upper branch very close to the first long vein, its stem nearly twice as long as the cell; stem of the second posterior cell about one and a third times longer than the cell; supernumerary cross-vein nearer the base of the wing than the mid cross-vein; posterior cross-vein a little more than its own length distant from the mid cross-vein.

Halteres with a pale stem and fuscous knob.

*Length*.—2.3 mm.

♂. Head brown, with flat dusky black scales in the middle and creamy ones at the sides, and a few long black bristles projecting forwards; eyes black and silvery; proboscis brown, rather bulbous at the tip, as long as the antennae; antennae grey, with brown bands in the middle of the joints, from which spring the brown verticillate hairs; basal joint dark brown and bright testaceous. Thorax much as in the ♀, but a little darker brown and with more numerous and longer black bristles over the roots of the wings. Abdomen as in the ♀, but narrower and rather more pubescent. Wings much as in the ♀, but the posterior cross-vein is relatively much longer.

Ungues of the mid legs very unequal, both simple, the larger much curved, the smaller nearly straight, hind claws equal and simple.

*Length*.—2.8 mm.

*Habitat*.—Salisbury, Mashonaland (Marshall) (97).

*Time of capture*.—March.

*Observations*.—Described from a single ♂ and ♀. A third specimen is differently ornamented and is placed as a distinct variety (var. *alba*). This species can easily be told by the rufous thorax, with its brown flat curved scales dotted about, its fuscous abdomen, the verticils of the antennae arising from the middle of the joints, the much curved second long vein, and by the curious mid unguis of the male. It comes very close to *Uranotaenia*, but all the members of that genus I have seen have the scutellum with flat scales.

It may therefore have to be removed from this genus, but its venation, general form and head ornamentation place it so close to a typical *Uranotaenia* that I imagine the specimens may have had some of the scutellar scales removed as other parts of the thorax have; in any case it shows close affinities to this genus, differing only in the presence of a few curved scales



Fig. 279.

Fore unguis (I.) and hind (II.) of *Uranotaenia Mashonensis* (♂).



on the scutellum. Although I could see no flat scales on the mesonotum in the type, they can be easily detected in the var. *alba*, and have been most probably denuded off.

Var. *alba*.

Head with flat white scales at the sides and on the sides of the occiput. Thorax bright rufous; pleurae pale ochraceous, with patches of flat white scales and a patch at the borders of the mesonotum just in front of the wings; abdomen with the second and fourth segments with broad apical white-scaled bands,

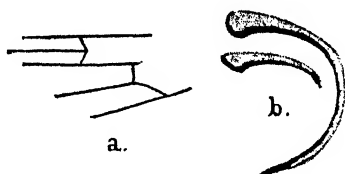


Fig. 280.

*Uranotaenia Mashonaensis*, var. *alba*. n. sp.  
a, Cross-veins; b, male ungues of fore leg.

the last segment with an apical median white-scaled patch. Posterior cross-vein more than twice its own length distant from the mid cross-vein, only about one and a half times its length distant from the junction of the anterior branch of the fifth vein with the stem.

*Length*.—2.5 mm.

*Habitat*.—Salisbury, Mashonaland (Marshall) (79).

*Time of capture*.—March.

*Observations*.—A single specimen, so much like the type structurally that I think it must be merely a variety with apical bands to some of the segments of the abdomen, and more white scales on the sides of the head and on the sides of the pleurae and mesonotum. I can only see the mid and hind claws which resemble those of the type.

11. *URANOTAENIA MINIMA*. n. sp.

Thorax deep brown (denuded), with long black bristles; metanotum with a pale median line. Abdomen dark brown, with narrow basal bands of pale yellowish-brown; pleurae and coxae very pallid. Small sized (2 mm.).

♂. Head brown, with dusky yellowish-brown scales forming a complete covering, a few long golden hairs projecting in front and black ones at the sides; eyes black; palpi pale yellowish-brown; proboscis long, much swollen towards the tip, yellowish-brown at the base, becoming dark towards the apex; antennae with a purplish-grey basal joint, remainder of the antennae yellowish-brown, with darker banding and brown plume hairs.

Thorax deep brown, shiny (denuded), with long black bristles, metanotum brown, with a pale median line; pleurae very pale yellowish-white.

Abdomen with the segments basally banded with pale yellowish-brown scales; the rest of segments with dark brown

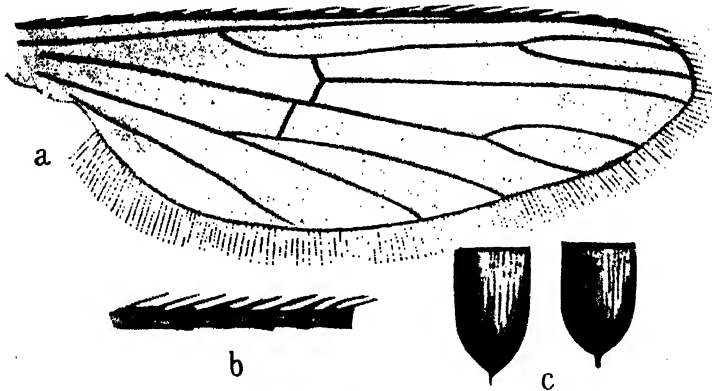


Fig. 281.

*Uranotaenia minima*. n. sp. (♂).

a, Wing of ♂ (X. 40); b, costal border; c, wing scales.

scales; posterior borders with pale hairs; the pale basal bands are slightly extended laterally; venter pale scaled.

Legs with the coxae very pale; all the femora pale whitish-yellow at the base and below, dark scaled above apically, extreme apex white; tibiae pale scaled below, dark above, apex pale; front metatarsi and first two tarsi apically pale yellow, last two joints pale yellowish-brown; mid metatarsi and first tarsal apically pale, also the whole of last joint; hind metatarsi apically and basally pale banded, also the first three tarsi; last tarsal joint yellowish-white. The tibiae of the mid legs look ochraceous in certain lights; both the tibiae and the metatarsi of the mid and hind legs have long bristles.

Wings with long pointed dark scales along the costa, a grey fringe at the apex and a pale fringe around the rest of the wing; veins covered by broadish short dark grey scales; first sub-marginal cell a little longer and narrower than the second posterior cell, its stem curved.

Halteres pale, with fuscous knob.

Length.—1.8 to 2 mm.

Habitat.—Quilon, Travancore, S. India (James, 7. 3. 1900).

Time of capture.—February (James).

Observations.—Only a couple of males of this species have so far been received. It is a very small species, small even for a member of the genus *Uranotaenia*. The pale pleurae and coxae and the dark stripe on the metanotum to some extent should easily separate it from all known species.

No notes were sent by Captain James concerning this species, which is evidently a male of the genus *Uranotaenia*.

## 12. URANOTAENIA (?) ARGYROPS. Walker.

(Brit. Mus. List, p. 2 (1848).)

Thorax when denuded ferruginous in front, black behind, with narrow curved hair-like brown scales; flat blue scales on the prothoracic lobes. Abdomen fuscous, with white apical lateral patches; venter with the apex of the segments white. Legs brown; femora with white apical spot and band; fore legs with apex of second, whole of the third, and base of the fourth tarsi dull white; third and fourth hind tarsi white. Ungues of the ♀ equal and simple.

♀. Head black, with a border of azure-blue flat scales round the eyes and black bristles projecting forwards; clypeus deep brown; antennae missing, basal joint clear pale ferruginous; eyes black, with a faint coppery sheen and a black line separating them; palpi two-jointed, black scaled, with a patch of silvery-white scales in the middle; proboscis black.

Thorax much squashed, but shows the following characters: when denuded, ferruginous in front, black behind, with traces of short, narrow, curved hair-like scales above and two rows of long golden-brown bristles behind, a single median row in front; on each side in front is a patch of small flat pale blue scales; scutellum ochraceous, with evidently flat dusky scales; metanotum

black anteriorly, pale brown posteriorly; pleurae brown, with patches of white scales.

Abdomen covered with flat fuscous scales, the testaceous ground colour showing through in places, each segment with a posterior border of short golden hairs, each segment with silvery-white lateral apical patches; venter with the segments white scaled apically.

Legs brown, the femora yellowish at the base, with a white apex, and a large white patch (not band) about its apical third, appearing pearly-blue in some lights; in the fore legs the apex of the second tarsal, the whole of the third and the base of the last dull silvery-white in certain lights; mid legs with the femoral bands not so distinct; the last tarsi with pale sheen, almost looking white at times; hind legs with the femoral bands more distinct, and white patches also at the apex of the tibiae; third and fourth tarsal joints pure white, and the apex of the second white; hind metatarsi half as long again as the tibiae; unguis small, simple, and black.

Wings densely scaled with brown, rather elongated, oval scales, both fork-cells long and narrow; first sub-marginal cell a little the longer, their bases nearly opposite one another; stems nearly equal, short; posterior cross-vein distant rather more than its own length from the mid cross-vein.

Halteres with pale ferruginous stems and fuscous knobs with dusky and grey scales.

*Length*.—7.5 mm.

*Habitat*.—New Zealand (Walker).

*Observations*.—The type is in the British Museum, and, I find, contrary to Col. Giles's statement, is in fair condition. It is a very distinct species with two-jointed palpi, certainly not a *Culex*, and, judging from its scale ornamentation and coloration, I cannot help placing it in the genus *Uranotaenia* of Arribalzaga, in spite of the rather long fork-cells; the basal cells are, however, short, as Arribalzaga describes, and the general coloration places it very close to, if not in, this genus. This species has been mentioned by Mr. Smith as occurring in dense masses in New Zealand; in one case "a train passed through a wall of them, three-quarters of a mile long, twenty feet high, and eighteen inches thick." I am not sure, however, if Mr. Smith was right in his identity of the species, for no one could identify it from Walker's original description, which gives no idea of its appearance.

The description of the type is here given as a matter of interest; no mention is made of the most important characters.

"*C. argyropus*, n. s. fem. Niger, argenteo micans, pedibus argenteo maculatis et cinctis, alis subfuscis, marginibus anticis nigris.

"Body black; mouth full half the length of the body; feelers shorter than the mouth; sides of the chest with silvery spots; legs black, very long; a silvery spot on each thigh, near the tip, which is also silvery, as are those of the shanks and of the joints of the feet; wings slightly tinged with brown; their fore borders black; veins dark brown, thickly fringed with black hairs; poisers dark brown.

"Length—of body,  $2\frac{1}{2}$  lines; of the wings 5 lines."

New Zealand. Presented by Dr. Sinclair.

NOTE.—A more recent examination of the type convinces me this species must be excluded from *Uranotaenia*.

## SECTION B.

PROBOSCIS FORMED FOR PIERCING; METANOTUM WITH CHAETAE.\*

## GENUS 19.—WYEOMYIA. nov. gen.

Head covered with flat scales; also the prothoracic lobes and scutellum; mesonotum with spindle-shaped and flat scales; *metanotum with bristles on its posterior half*. Palpi small in the

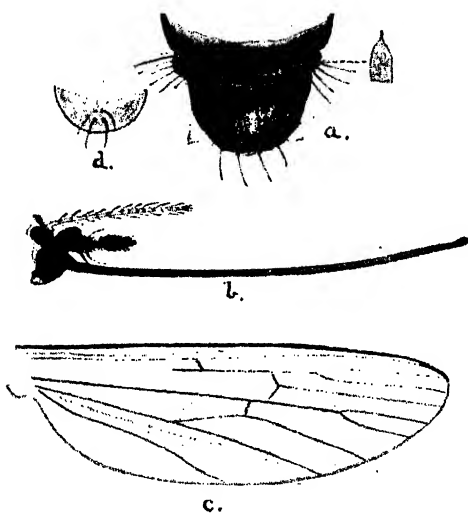


Fig. 282.

Genus *Wyeomyia*.

a, Metathorax of *Wyeomyia lunata*. n. sp.; b, head, &c., of female; c, wing of *Wyeomyia Grayii*. n. sp.; d, metathorax of *Wyeomyia Grayii*. n. sp.

female, apparently four-jointed; antennae fourteen-jointed, basal joint of moderate size; proboscis long and thin, often longer than the whole body. Wings with the basal lobe long and narrow; fork-cells long and narrow. Abdomen unbanded, but with either apical or basal white lateral spots or unadorned.

\* The genus *Sabethes* comes in this section (*vide* Appendix).

Ungues of the female equal and simple. Wing scales thin or moderately broad, symmetrical.

Six species of this genus have been received from the West Indies, South America, India, and Malay Peninsula. Dr. Lutz speaks of them as "Wood Mosquitoes," and says they all haunt damp woods near the river or seashore, where the "bromelias" are abundant, and always contain water. Most of them are likely to breed in "bromelias," some only do so. These "wood mosquitoes" have a peculiar habit of, so to speak, staying in the air with the last pair of legs thrown over the back, and, with their thin body and long legs, looking very much like spiders. They will attack man and dogs in the daytime. The pale parts of their legs shine distinctly in the sun while they are staying in the air.

The character by which I have separated these species from *Aedes* is the presence of bristles on the metanotum, seen in no other members of the family Culicidae except *Sabethes* and *Trichoprosopon*. These chaetae, when denuded, leave a distinct scar where they were attached.

The larvae are, according to Dr. Lutz, of *Culex* type, but are usually coloured red, green, or blue.

The species *W. Grayii*, from St. Lucia, is a solitary species occurring up to 1000 feet above sea-level in the forests, and *W. pertinans* occurs high up as well, and in woods and forests.\*

#### SYNOPTIC TABLE OF SPECIES.

- A. Abdomen unadorned.
  - Metathorax with four bristles placed in a square ..... *Grayii*. n. sp.
  - Metathorax with a row of bristles ..... *pertinans*. Williston.
  - Metathorax destroyed; base of venter of abdomen white ..... *aranoides*. n. sp.
- AA. Abdomen with basal lateral white spots and two metathoracic chaetae in a row; proboscis very long..... *longirostris*. n. sp.
- Three metathoracic chaetae in outer row, two behind; mid-tarsi white on one side; proboscis very long..... *Trinidadensis*. n. sp.
- AAA. Abdomen with apical white lateral spots and four metathoracic bristles in two tufts; proboscis long..... *lunata*. n. sp.
- AAAA. Abdomen with white basal bands, expanding laterally into spots ..... *microptera*. n. sp. (?) (Giles MS)

\* The species described here as *Wyeomyias* very closely resemble *Sabethes*, but the wing scales are never asymmetrical as in that genus.

1. *WYEOMYIA* GRAYII. n. sp.*Aedes perturbans*. Williston (?).(Trans. Ent. Soc. Lond. 1896, p. 272, Williston (= *perturbans*) (?).)

(Fig. 144, Pl. XXXVI.)

Thorax testaceous-brown, with dusky scales; pleurae ochraceous, densely clothed in parts with broad white scales. Abdomen dusky black above; venter ochraceous. Legs black, coxae and venter of the femora ochraceous; unguis of the ♀ equal and simple; metanotum with four chaetae placed quadrangulately; proboscis not quite as long as thorax and abdomen.

♀. Head covered by flat broad scales, dull purplish in the middle, ochraceous at the sides, and white between the eyes; in some specimens the ochraceous scales border the eyes as well; clypeus ochraceous-brown; antennae almost black, with pale pubescence, short, only a little more than half the length of the proboscis, hairs long, bases of the joints with narrow pale bands; palpi short, black scaled; proboscis black, long, and thin, swollen at the tip, nearly as long again as the antennae, apex pilose; eyes deep purplish-black.

Thorax testaceous-brown, covered with flat, spindle-shaped, dusky-black scales; over the roots of the wings and along the posterior part of the mesonotum are thickly spread flat dusky-black scales, of similar form to the flat head scales; bristles black; scutellum ochraceous, with four long black bristles and two very small ones to the central lobe, with overlapping flat dusky scales, which on the lateral lobes form a small black patch; the lateral lobes have large and small black bristles; metanotum bright brown, with purplish reflections, and with a little tuft of bristles on its posterior half, arising from black spots, so that their presence can always be detected even if the bristles have gone; these bristles are arranged near the apical end of the metanotum quadrangulately, one bristle marking each corner, the two lowest being rather nearer together than the two uppermost chaetae; pleurae paler yellowish to ochraceous, densely clothed in parts with short, broad, white scales.

Abdomen covered with dusky-black scales, with the posterior borders of the segments with very minute border-bristles; venter ochraceous, clothed with pale, almost creamy-yellow scales.

Legs long, black; coxae very pale, and also the ventral



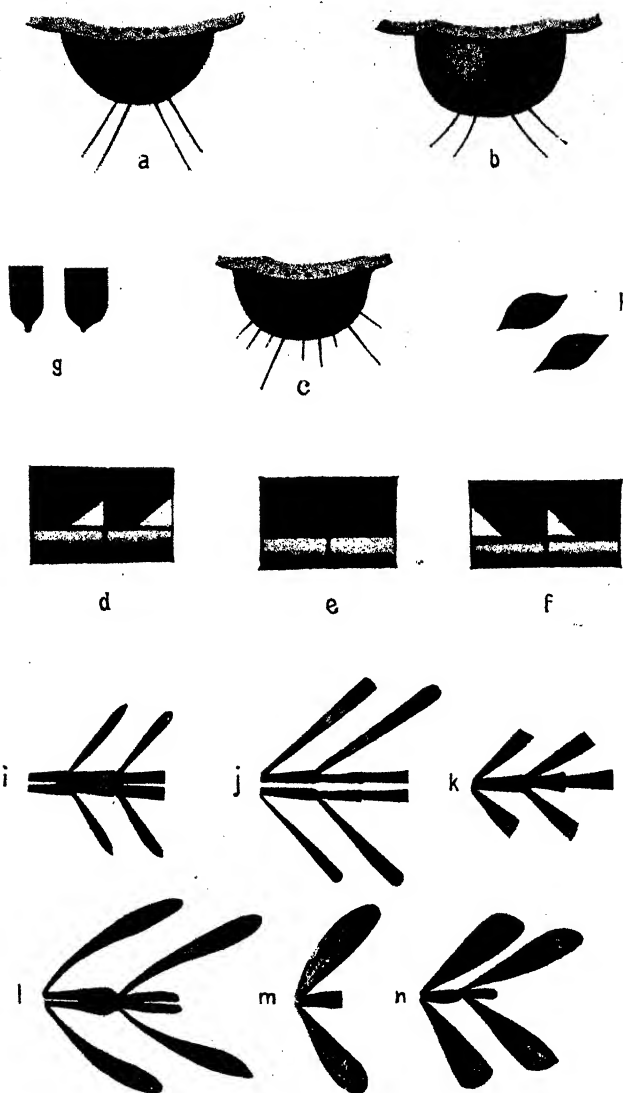


Fig. 283.

Genus *Wyeomyia*. n. sp.

- a, Metathorax of *Wyeomyia Grayii*. n. sp.; b, of *Wyeomyia lunata*. n. sp.; c, of *Wyeomyia pertinans*, Williston; d, lateral view of the abdominal segments of *Wyeomyia longirostris*. n. sp.; e, of *Wyeomyia Grayii* and *Wyeomyia pertinans*; f, of *Wyeomyia lunata*; g, scutellar scales; h, thoracic scales; i, wing scales of *Wyeomyia Grayii*; j, of *Wyeomyia pertinans*; k, of *Wyeomyia longirostris*; l to n, of *Wyeomyia lunata*.

surface of the femora; knee spot small and pale; hind metatarsi longer than the hind tibiae; ungues equal and simple.

Wings with the veins clothed with umber-brown scales, the stem of the fourth with long thin scales on one side (Fig. 283, i), also the branches of the second to fifth and the base of the second; first sub-marginal cell longer and a little narrower than the second posterior cell, its base considerably nearer the base of the wing than the base of the latter, stem about one-third the length of the cell; stem of the second posterior cell rather more than two-thirds as long as the cell; posterior cross-vein about its own length distant from the mid cross-vein; the marginal transverse vein joins the second long vein sharply and at an obtuse angle, the vein being carried a little way beyond it and scaled (*vide* Fig. 282, c). Halteres ochraceous, with a deep fuscous knob.



Fig. 284.

Wing of *Wyeomyia Grayii* (♀). (X. 9.)

*Length*.—3 to 3.5 mm.; of hind legs 8.5 mm.

*Habitat*.—Castries, St. Lucia (St. George Gray, 1. 2. 1900); Grenada (Broadway) (63).

*Time of capture*.—December 25 (St. Lucia); February (Grenada).

*Observations*.—Some specimens were taken at an elevation of 1000 feet at 2 P.M., at a place called Piton, Flore Farm, in the forest in St. Lucia.

This species comes in my new genus, for which Professor Lankester proposed the name *Wyeomyia*, the distinguishing character being the metathoracic bristles.

It is a solitary species, and is very common where it occurs (in St. Lucia). Specimens sent by Mr. Broadway from Grenada, taken on the Ballast Ground during February, differ slightly from the St. Lucia specimens. The head scales are more ochraceous and the posterior cross-vein is slightly nearer the mid than in the St. Lucia specimens. They are not distinct, however, as far as I can see.

This may be Williston's *Aedes perturbans*. But I have not yet seen specimens from St. Vincent. The description, however, would apply to this as well as to one or two other species. It is closely related to the species I take to be *Aedes* (*Wyeomyia*) *pertinans* of Williston, but differs from it in the disposition of the metathoracic chaetae and in the position of the cross-vein and fork-cells.

## 2. WYEMYIA PERTINANS. Williston.

(Trans. Ent. Soc. Lond. 1896, p. 271.)

Thorax brown, with dusky-brown scales on the mesonotum; pleurae yellowish-brown with white scales; metanotum deep brown, with usually four large bristles in a straight line and some smaller ones between them, usually making from six to nine in all. Abdomen deep brown, with dusky-brown scales; venter ochraceous. Legs deep brown; femora and tibiae yellowish ventrally. Ungues of ♀ equal and simple.

♀. Head yellowish-brown, with flat scales, ochraceous at the sides, purplish-brown in the middle; clypeus deep brown; antennae almost black, basal joint pale testaceous, pubescence pale; palpi black scaled; proboscis covered with black scales, yellowish at the base owing to the absence of scales.

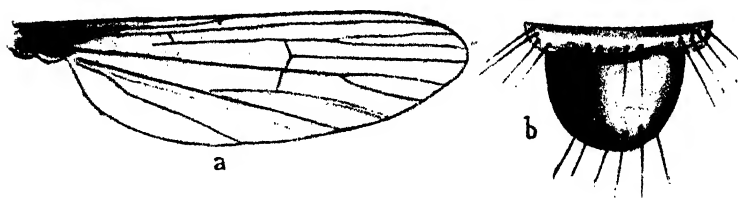


Fig. 285.

*Wyeomyia pertinans*, Williston.

a, Wing (X. 20.); b, scutellum and metanotum.

Thorax deep brown, with flat dusky-bronze scales over the mesonotum; over the roots of the wings are long flat purplish-brown scales, and also over the sides of the scutellum, and to some extent over the middle lobe; pleurae yellowish-brown, with white scales; scutellum brown, with four large bristles to the central lobe and others to the lateral lobes; metanotum deep brown, with four large bristles arising from its apical half in a line, and some smaller ones, usually making from six to nine in all.

Abdomen covered with dusky-brown scales above and with creamy scales below, on a yellow ground.

Legs deep blackish-brown; the base of the femora and coxae paler, of a yellowish tint, also the tibiae and femora on their ventral surfaces; hind metatarsi longer than the tibiae; unguis of the ♀ equal and simple.

Wings (Figs. 285, a, and 287), with the veins clothed with brown scales very similar to *W. Grayii*, the first sub-marginal cell longer and a little narrower than the second posterior cell, its base only a little nearer the base of the wing than the base of the second posterior, twice the length of its stem, which is

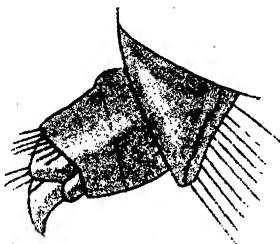


Fig. 286.  
*Wyeomyia pertinans* (after  
Williston).



Fig. 287.  
Apex of wing of  
*Wyeomyia pertinans*. (♀).  
(X. 9.)

a little shorter than the stem of the second posterior cell; stalk of the second longitudinal passes the end of the marginal cross-vein; *posterior cross-vein nearly in a line with the mid cross-vein*, but a little longer. Long lateral scales on one side only of the stem of the fourth long vein.

Halteres ochraceous, with fuscous knob.

*Length*.—3 mm.

♂. Apparently like the ♀, but the "antennae a little more hoary" (Williston), and the unguis will probably differ, and also the wing venation to some slight extent (F. V. T.).

*Habitat*.—St. Vincent (H. Powell, 10. 6. 1899), and Coast of St. Vincent (Williston).

*Time of capture*.—May (12. 5. 1899).

*Observations*.—There are several species from the West Indies that will answer to Williston's description of *Aedes pertinans*, but those sent by Mr. Powell from St. Vincent most nearly agree, and although the original description is too short to be of any value when dealing with a number of closely related species spread over the world, I think the specimens sent by him from the Convent Estate must be Williston's *Aedes pertinans* found on the coast and on the hills at 1000 feet. If this is so, and I cannot see otherwise, *Aedes pertinans* comes in my new genus *Wyeomyia* on account of the metathoracic bristles and the venation.

It at first sight would be taken for *W. Grayii*, mihi, from St. Lucia, but the posterior and mid cross-veins are nearly in one line,

whereas in *W. Grayii* the posterior cross-vein is some way nearer the base of the wing, and the bases of the fork cells are much nearer one another than in *W. Grayii*, and the stem of the second posterior cell is a little shorter relatively to the cell. Without a minute examination they would certainly be considered the same species.

A microscopic examination shows, however, that the metathoracic bristles are differently arranged, the chaetae being in one line, with smaller chaetae between the four larger ones.

These small chaetae often, however, are nearly as large as the others, as many as nine may occur.

### 3. WYEMYIA ARANOIDES. n. sp.

Thorax shiny black when denuded, with deep bronzy-brown scales; pleurae dark in front, pallid posteriorly, with white scales; prothoracic lobes with white scales. Abdomen dusky brownish-black above, creamy-white below, especially at the base. Legs ochraceous with brown scales, darkest at the tibiae and tarsi; ungues of the ♀ equal and simple.

♀. Head covered with flat dusky-brown and black scales, grey round the eyes and white at the sides; clypeus bright ferruginous, with two rows of white scales; proboscis longer than the whole body, deep brown with coppery reflections; palpi deep brown, densely scaled with brilliant coppery reflections; antennae dark brown; basal joints deep brown and bright testaceous.

Thorax deep shiny black, with small flat spindle-shaped deep bronzy scales, some grey ones in front, and a few small pale



Fig. 288.

Front of mesothorax and prothoracic lobes of *Wyemyia aranoides*. n. sp.

golden hairs projecting over the head, broader pale dusky flat ones over the posterior part; prothoracic lobes black, with grey and brown scales and six brown bristles projecting over the head, three on each lobe (Fig. 288); scutellum bright ochraceous (denuded); metanotum black (damaged by

pin, so that the chaetae cannot be seen); pleurae blackish-brown in front, deep ochraceous behind, with some flat white scales.

Abdomen covered with dusky black scales, with here and

there a grey one; first segment entirely black scaled, with short golden hairs; venter deep ochraceous, with white and pale ochraceous scales.

Legs very long, ochraceous, covered with deep brown scales, the tibiae and tarsi deep brown; coxae and trochanters pale ochraceous, both with white scales; unguis small, equal and simple.

Wings bright testaceous at the base; veins with small deep brown median and narrow lateral brown scales; first submarginal cell a little longer and decidedly narrower than the second posterior cell, its stem nearly as long as the cell, its base level or slightly nearer the apex of the wing than the base of the second posterior cell; second posterior cell with its stem also nearly as long as the cell; supernumerary and mid cross-veins meeting; posterior cross-vein about one and a half times its own length distant from the mid cross-vein; fringe pale brown, border-scales dark.

Halteres with bright ochraceous stem and knobs, the latter darkened with fuscous scales.

*Length*.—3 mm. (body); (fore legs 6.5 mm.; hind 8 mm.)

*Habitat*.—Taipang, Perak, Straits Settlements (Wray) (22. 11. and 21. 12. 99).

*Observations*.—Described from a single ♀. Although the metanotum is destroyed by the pin, so that I cannot see the chaetae characteristic of the genus *Wyeomyia*, I feel sure from the general appearance of the insect that it comes in this genus of the section *Aedeomyia*, the general long-legged spidery appearance being very marked. It can be told from others I have placed in the genus by the pure white basal ventral surface of the abdomen and the remaining ochraceous part. Moreover, the clypeus is very brilliant ferruginous, such as we see in no other member of the genus.

#### 4. *WYEOMYIA LONGIROSTRIS*. n. sp.

(Fig. 123, Pl. XXXI.)

Thorax black, shiny when denuded, covered with dusky and bronzy scales; prothoracic lobes with broad scales, showing metallic reflections; metanotum deep black, with two clear golden-brown bristles near the posterior border (and two smaller ones?); pleurae testaceous and brown. Abdomen dusky-black,

with lateral basal white patches; venter pale scaled. Legs dark brown, long; coxae ochraceous. Ungues of the ♀ equal, simple.

♀. Head black, with flat black scales, with metallic green and purple reflections; sides of the head with similar grey scales; two long black bristles project in front between the eyes, and other shorter ones on each side; eyes of a pale coppery and purple hue; proboscis very long, much longer than the whole body, sometimes nearly as long again, at others only half as long again, thin, covered with dark brown to black scales, hairy at the apex; antennae deep brown, the basal joint of a deep purplish-black, less than one-third the length of the proboscis; palpi very short, covered with deep purplish-black scales, somewhat testaceous at the base, apparently four-jointed, the last joint being very small; clypeus deep purplish-black.

Thorax deep black, shiny when denuded, covered with dusky-black and bronzy-black flat spindle-shaped scales, a tuft of deep brown bristles over the roots of the wings; prothoracic lobes covered with broad scales, with metallic purple reflections; scutellum black, plated with broad overlapping scales, with faint yellow metallic reflections in some lights, brilliant iridescent metallic in others; border-bristles bright brown; metanotum deep purplish-black, with two distinct golden-brown bristles on the posterior half near the edge, as in *W. Grayii*, and with apparently two smaller ones close to them; pleurae testaceous, and dark brown.

Abdomen covered with dusky-black scales, with dull purplish reflections in some lights, with lateral, basal, triangular patches of silvery-white scales; venter with silvery-white scales; posterior borders of the segments with very short golden-brown bristles.

Legs long, covered with dark brown scales, with ochraceous and bronzy reflections; coxae pale ochraceous; hind metatarsi longer than the tibiae; mid and hind ungues equal, simple.

Wings with brown scales to the veins, the median ones rather long, the lateral ones long, curved and truncated; fork-cells long and narrow, the first sub-marginal cell a little the narrower of the two, their bases nearly level, stem of the first sub-marginal cell about half the length of the cell, equal to that of the second posterior cell; posterior cross-vein about its own length distant from the mid cross-vein; fringe scales of three types: (i) very long stalked spindle-shaped ones; (ii) shorter ones of the same shape; and (iii) darker, short, broader border scales; basal lobe of the wing long, with five bristles in a row.

Halteres with ochraceous stems, with a line of black scales up one side and black scales round the knob.

*Length*.—3·5 to 4 mm.

*Habitat*.—Rio de Janeiro (Dr. Lutz, 4. 7. 1899).

*Observations*.—Described from more or less damaged specimens sent by Dr. Lutz. This species can be readily identified, however, by the extremely long proboscis, and is thus easily separated from *W. Grayii*; the metathoracic bristles are also in a group of four, instead of in a straight line, as in *W. pertinans*. Dr. Lutz calls it the "Wood Mosquito."

Although the specimens are rather damaged, one can detect basal white lateral spots on the abdomen clearly in the best specimen. Its long rostrum is very marked, and should make its identity an easy matter.

#### 5. WYEOMYIA TRINIDADENSIS. n. sp.

Thorax deep brown, with bronzy scales. Abdomen black, with metallic green reflections, basal white lateral spots, which often pass into basal bands, venter white scaled. Legs long, black, the mid tarsi white above. Ungues small, equal, simple. Proboscis as long or longer than the whole insect.

♀. Head covered with flat brown scales with metallic violet and sometimes green reflections, sides with rather grey scales; around the eyes are short black bristles projecting over them; eyes black and coppery, two long pale brown bristles project from the head between them; antennae rather short, black, basal joints with a grey sheen, almost white in some lights; palpi very short, covered with purplish-brown scales; clypeus brown, with grey sheen; proboscis thin, very long, as long or longer than the whole insect, deep brown with metallic reflections.

Thorax deep brown, with flat spindle-shaped bronzy-green scales, which appear deep bronzy in some lights; numerous deep brown and golden-brown bristles over the roots of the wings; prothoracic lobes covered with flat scales, showing blue, violet and ochraceous reflections, and a few forwardly projecting bristles; scutellum densely clothed with flat bronzy scales, black when denuded; mid lobe with four border-bristles, the two median ones crossing one another; metanotum nearly black, with apparently three bristles in a row behind and two in front; pleurae brown, densely clothed with flat white scales.



Abdomen black, clothed with rather large flat black scales, which are more or less metallic in reflected light, deep black in other lights; at the base of each segment is a silvery-white scaled lateral spot, which on the last two segments form more or less complete white basal bands; apical segment with black bristles; first segment brown, with grey scaled sides; posterior border-bristles very short; venter densely clothed with silvery-white scales.

Legs with pallid ochraceous coxae, and covered with white scales, remainder covered with deep blackish scales with metallic purple and bronze reflections; femora white scaled beneath; hind metatarsi about one-third longer than the tibiae; ungues equal and simple, very small; tibiae spiny; the first, second and third tarsi of the mid legs are white scaled on one side.

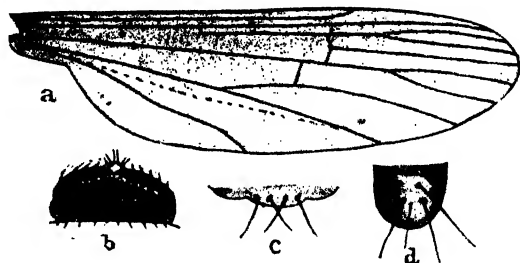


Fig. 289.

*Wyomyia Trinidadensis*. n. sp.

, Wing of ♀ (X. 20.); b, head; c, scutellum; d, metanotum

Wings with brown scaled veins, blackish along the costa and towards the roots, the base being ochraceous-yellow; the lateral scales are long and thin, the median small, rather thick; first sub-marginal cell longer and narrower than the second posterior cell, its stem not quite half the length of the cell, its base a little nearer the base of the wing than that of the second posterior cell; stem of the latter longer than the stem of the first sub-marginal cell, equal to about two-thirds of the length of the cell; posterior cross-vein a little longer than the mid cross-vein, distant from the latter about its own length.

Halteres with bright brown stem and fuscous knob.

*Length*.—2.8 mm.; with proboscis 4.5.

*Habitat*.—Trinidad (Urich).

*Time of capture*.—November and December.

*Observations*.—Described from a good series of ♀'s sent by Mr. Urich. It can at once be told from all other *Wyomyias*

by the abdomen having silvery-white lateral spots, which form bands apically, and by its black scaly appearance, the white abdominal bands being very clear and also the white on the tarsi. Some specimens show more abdominal bandings than others. I think the white on the mid tarsi is entirely dorsal. The proboscis is very long. They are found in cocoa groves bordering the forests, and in the forest amongst the second growth, and do not enter houses.

6. *WYEOMYIA LUNATA*. n. sp.

Thorax brown and ferruginous, with brown, flat, spindle-shaped scales; pleurae pale, with pale golden sheen; head with golden scales in front and behind, and with a *semicircular band of black upright fork scales across the nape*; metanotum with four chaetae in a line. Abdomen brown, with steely reflections, with apical pale golden triangular lateral spots to the segments and pale golden bands ventrally; first segment ochraceous, with pale hairs. Legs brown; bases and venter of femora yellow; apical fore tarsi somewhat of an ochraceous tint, when denuded ochraceous. Ungues equal and simple in the ♀.

♀. Head covered with flat violet-brown scales on the occiput, with golden ochraceous scales at the sides and behind; across the back of the head runs a semicircular line of almost black forked upright scales, one deep, looking like a black curved line with a hand-lens—this character will at once separate this from all other species; the ochraceous scales have a metallic sheen in some lights; eyes black; palpi black scaled; antennae dark brown, with narrow pale bands; first basal joint ferruginous; proboscis very long, nearly as long as the abdomen, curved downwards, clothed with small dark brown scales, which have a coppery reflection on its under-side; apex hairy; clypeus testaceous.

Thorax dark brown, bright ferruginous in places behind, more or less covered with flat spindle-shaped scales, which give it a bright brown appearance in certain lights, but under the microscope appear fuscous; in some specimens the thorax is brown; scutellum covered with flat scales, with a purplish-brown tinge in the middle, border pale ochraceous-brown; metanotum bright



Fig. 290.

*Wyeomyia lunata*. n. sp.

reddish-brown, with purplish reflections, with four distinct chaetae and traces of two others, forming two tufts of bristles close together on the apical half of the metanotum; pleurae bright chestnut-brown, with a dense mass of flat, shiny, creamy-white to pale golden scales running from the head to just below the root of wing; the scales are closely applied, and overlap one another regularly, like those on a lepidopterous wing, a few similar scales scattered about over the legs.

Abdomen covered with dusky purplish-brown scales, with here and there bright brown patches where the scales have been denuded; laterally there are apical patches of shiny creamy-white to golden scales, except on the first and last segments, although those on the second and third often do not show; these lateral patches are continuations of the ventral scales upwards, the ventral surface being mostly covered with such scales, but each segment has a triangular basal patch of dark scales on each side; posterior border-hairs small and fine, reddish-brown; the first segment is ochraceous, with dark median scales and pallid hairs.

Legs clothed with deep brown scales, with bronzy-ochraceous reflections; bases and under-sides of the femora with bright yellowish-brown scales; a yellowish spot at the tibio-metatarsal joint; the last fore tarsal of a somewhat yellowish tint; mid and hind legs the same, but with bright metallic ochraceous reflections; steel blue reflections also seen in some lights; unguis equal and simple.

Wings with veins covered with broadish brown scales, except on the basal half of the fourth long vein, the lower branch of the fifth and the sixth, which have long scales as well; the scales are particularly thick, and rather darker towards the tips of the veins; costa, first longitudinal, and base of the fifth long vein with darker purple scales; first sub-marginal cell longer and a little narrower than the second posterior cell, its stem less than half the length of the cell; mid cross-vein considerably longer than the supernumerary cross-vein; posterior cross-vein only a little way distant from the mid cross-vein, sloping towards the apex of the wing.

Halteres ochraceous, with fuscous knob.

*Length*.—6 mm.

*Habitat*.—Rio de Janeiro (Moreira, 9. 12. 1899).

*Time of capture*.—July.

*Observations*.—A series of this species sent by Senhor Moreira

from Rio were all females. It can at once be told from all other *Wyeomyias* by the semicircular dark band of scales on the nape. The species is very bright when fresh, and the golden-yellow apical lateral spots and venter of the abdomen are characteristic.

7. *WYEMYIA* (?) *MICROPTERUS*. Giles.

"Wings unspotted, tarsi unbanded; thorax dorsally unadorned, but with white spots on the pleurae. Abdominal segments black, with white basal bands expanding into lateral spots, and a distal fringe of yellowish hairs. Wings proportionately very small.

"Head black, with a pair of snowy spots on the nape, especially distinct in the male. Antennae black, the plumes of the male having a very marked silvery reflection in certain lights. Palpi black, longer than the proboscis by rather more than the length of the terminal joint, very minute in the ♀. Proboscis black, with a distinct but minute white or yellowish tip.

"Thorax with a black ground, covered with a bronzy tomentum and a number of strong bristles, which become especially marked along the posterior border of the scutellum, which is armed with a median and a pair of lateral tufts of strong bristles nearly as long as the first two abdominal segments. There are some snowy spots on the pleurae, and a tendency to longitudinal ornamentation of the dorsum, but not sufficiently contrasted to catch the eye. Wings markedly shorter than the abdomen, hyaline with densely black scaled veins. Auxiliary vein joining the costa about the level of the middle transverse vein, which is placed a long

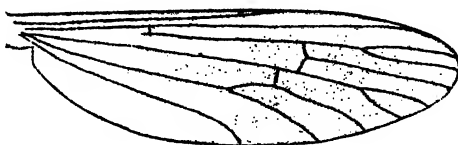


Fig. 291.

Wing of ♀ *Wyeomyia* (?) *micropterus*. n. sp.  
(After Giles.)

way outside the posterior transverse, especially in the male; fork-cells short with long equal stems; the posterior being shorter and wider than the anterior, supernumerary and middle transverse veins in one line. Halteres light yellow with darker knobs. Legs short and stout, almost uniformly black save for the femora below, a minute knee spot and a tiny band at junction of tibia with first tarsal joint, yellowish-brown. Hind tibia about the same length as the first tarsal joint. Abdomen black, with a very narrow basal snowy band (which often disappears on drying), expanding laterally into distinct spots; and with a fringe of yellowish

hairs along the distal borders of the segments; venter black, with broad basal snowy bands to the segments. Male claspers black, proportionally large.

"*Length*.—of wings in ♂, 2.2 mm., of abdomen, 2.5 mm.

"*Habitat*.—Allahabad and Lucknow in houses.

"*Observation*.—A small, heavily-built mosquito, nearly black throughout, the abdominal banding often disappearing by shrinkage in drying, with short thick legs and exceptionally small wings."

NOTE.—In the description first sent me by Col. Giles he says: "A number of strong bristles, which become especially marked along the posterior border of the metanotum, which is armed with a median and lateral pair of tufts of strong bristles, nearly as long as the first two abdominal segments." This clearly refers to the *scutellum*, not metanotum. On pointing this out to my friend, he writes the following: "The species I thought must belong to your *Wyeomyia* had bristles both on the scutellum and metanotum." The male has long palpi.

Some mistake has been made here, the insect referred to is undoubtedly a typical *Culex*. (F. V. T.)

## SECTION C.

PROBOSCIS FORMED FOR PIERCING; METANOTUM WITH SCALES  
AND CHAETAE.

## SUB-FAMILY TRICHOPROSOPONINA.

## GENUS 20.—TRICHOPROSOPON. nov. gen.

Head clothed with flat scales and with a ring of upright forked scales across the posterior half; antennae 14-jointed in the ♀, the joints with two distinct rows of verticillate hairs, one long and the other short, basal lobe of the antennae bristly. Palpi in the ♀ 3-jointed, densely scaled; in the ♂ 4-jointed, the joints nearly equal, tapering, apex spinose; clypeus (Fig. 292, m.) densely bearded with short bristles and long ones in front; proboscis long, scaly, and pubescent at the rather expanded apex. Thorax covered with rather flat spindle-shaped scales; prothoracic lobes distinct, with flat scales; scutellum with dense flat spindle-shaped scales; *metanotum with a tuft of chaetae and with flat scales on part of its surface* (b). Abdomen covered with flat scales, and in the ♀ with the apex very bristly; in the ♂ the basal lobes of the genitalia densely scaled. Ungues of the ♀ small, equal and simple, in the ♂ those of the fore and mid legs unequal and simple, in the hind very small, equal and simple. Wings densely scaled along the veins, with rather broad flat scales, somewhat like those of *Taeniorhynchus*, but shorter; fork-cells rather long, the second long vein carried nearly to the base of the wing, the anal cell very large, and the mid cross-vein nearer the apex of the wing than the supernumerary cross-vein, the posterior cross-vein on a line with the mid cross-vein.

This genus is founded primarily on the presence of not only chaetae but *scales on the metanotum*, and the curious bearded or

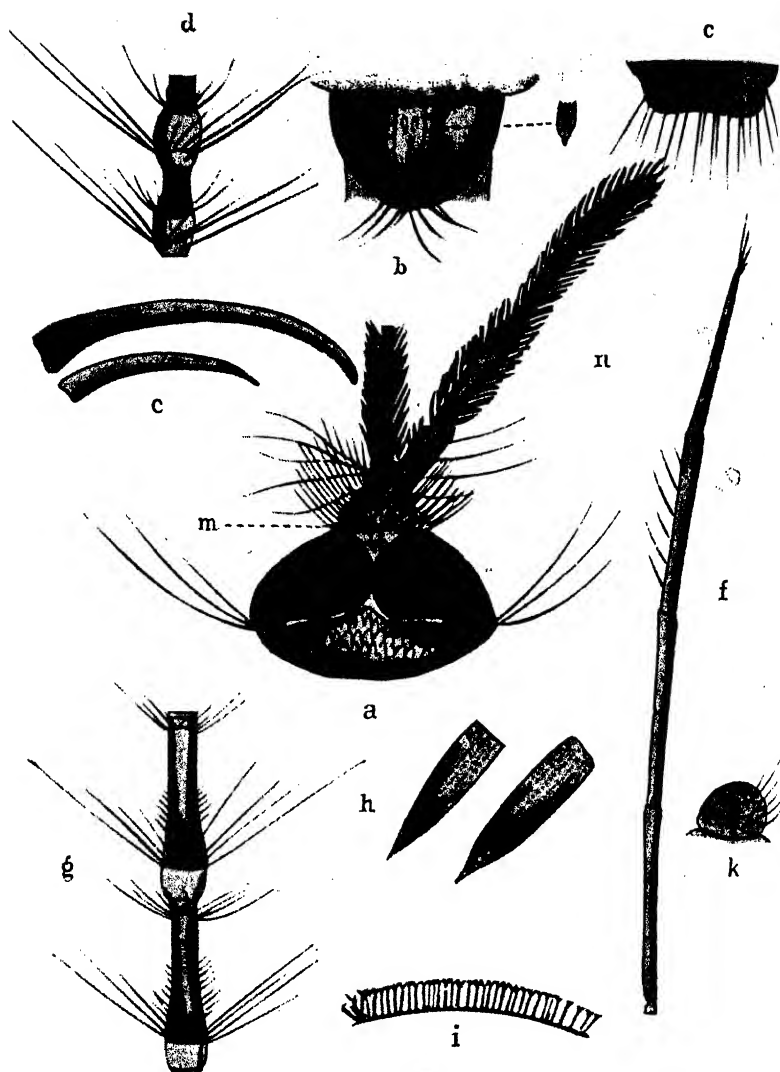


Fig. 292.

*Trichoprosopon nivipes*. n. sp.

a, Head of ♀, clypeus (m) and palpus (n); b, metathorax; c, scutellum; d, two joints of ♀ antennae; e, fore ungues of the ♂; f, male palpus; g, male antenna; h, wing scales; i, upright forked scales of head; k, basal joint of antenna.

bristly character of the clypeus and basal joints of the antennae. The wing venation (Fig. 293) is also peculiar in regard to the great elongation of the second long vein, the great size of the anal cell, and the relative positions of the cross-veins.

A single species only so far has been received. As only one ♂ is present in the series I have not been able to dissect it, and so cannot see the structure of the genitalia.

Mr. Ulrich has found the breeding-place of the species, so I hope soon to have an opportunity of describing the larvae.

TRICHOPROSOPON NIVIPES. n. sp.

(Fig. 137, Pl. XXXV.)

Thorax dark brown, pleurae and front of the mesothorax at the sides bright ochraceous, with a distinct silver spot on the middle of the pleurae. Abdomen deep metallic purple above, golden-yellow below, with lateral triangular golden spots. Legs deep brownish-black, with purple and blue metallic reflections, the four tarsi of the mid legs and last two of the hind legs pure white in both sexes. Ungues of the ♀ small, equal and simple; in the ♂ the fore and mid unguis unequal, simple, and in the hind legs equal and simple.

♀. Head completely covered with bright ochraceous flat scales with metallic mauve reflections, sometimes entirely mauve; those at the side and just round the eyes show silvery-white reflections in some lights; projecting over the eyes are short dark brown bristles; eyes deep purplish-black, green and blue; antennae brown, with pale rings, and a double set of verticillate hairs, the larger ones arising from just above the paler bands, the smaller from just below; hairs dark brown; basal joint rather brighter brown on one side, with numerous curved brown hairs; clypeus brown, densely covered with black bristles; palpi covered with blackish scales with dull purple reflections, moderately long proboscis, covered with brown scales, somewhat ochraceous in the middle and darker at the apex.

Thorax brown, the mesonotum covered with bronzy spindle-shaped scales; sides of the mesonotum ochraceous; prothoracic lobes deep ochraceous, with flattened scales, which show mauve tints, and brown bristles; scutellum chestnut-brown, covered with dark flat scales, showing peacock-blue and green reflections; metanotum deep brown and chestnut-brown, with two median rows of small flat blue scales and a dense tuft of bristles arranged in two lateral lines (Fig. 292, b); pleurae ochraceous, with numerous patches of small flat dull white scales and a somewhat darker patch in the middle.



Abdomen steely in places, the apical segment bright testaceous; covered with deep purplish-brown scales showing brilliant purple and mauve reflections; apex densely bristly; laterally are creamy-white to yellow scales, forming more or less triangular patches, the bases of the triangles being on the apical borders of the segments; venter ochraceous, with creamy-yellow and pale creamy scales.

Legs brown, covered with deep brown scales, which show brilliant purple and blue reflections, and in places a dull ochraceous tint; on the apices of the joints and along the tibiae are short black spines; mid legs with all four tarsi white above; hind legs densely scaly, the last two tarsi pure white; tibiae slightly pale at the base; hind metatarsi as long as the tibiae; unguis small, equal and simple.

Wings dusky, the veins very densely covered with rather broad scales, like *Taeniorhynchus*; fork-cells long, the first sub-marginal considerably longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter; stem of the first sub-marginal rather short, considerably less than

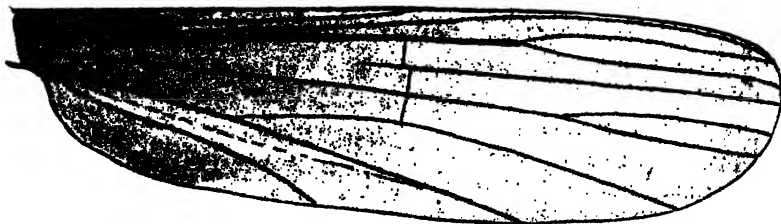


Fig. 293.

Wing of ♀ *T. nivipes*. (X. 14.)

half the length of the cell; stem of the second posterior more than half the length of the cell; mid cross-vein a little nearer the apex of the wing than the supernumerary cross-vein; posterior cross-vein on a line with the mid; the sub-costal joins the costal a little past the level of the cross-veins; the second longitudinal vein carried nearly to the base of the wing; the anal cell is very large.

Halteres with an ochraceous stem and fuscous knob, and numerous black scales on it, which pass down the stem.

*Length*.—7 to 8 mm.

♂. Very similar to the ♀; antennae banded brown and white, with two rows of verticillate hairs, the larger dense, long

and brown; the penultimate joint densely hairy; basal joint testaceous-yellow; palpi long and thin, deep bronzy-brown, 4-jointed, the joints of nearly equal length, the apex with four thick spines, and the penultimate joint with a few black lateral spines.

Abdomen peacock-blue at the base, remainder purple; basal joint scaly, brown.

Fore legs all deep metallic purple with bronzy reflections; mid legs with the four tarsi pure white, the last showing dark reflections; hind legs with the last two tarsi only white; fore and mid ungues black, unequal, simple, the fore nearly straight, the mid rather more curved, the hind very small, equal and simple.

Wings with the cross-veins as in the ♀, the brown scales showing a deep violet tint in the light.

*Length*.—7.5 mm.

*Habitat*.—Trinidad (Urich).

*Time of capture*.—December.

*Observations*.—Described from several ♀'s and a single ♂. It is a very beautiful mosquito, quite unlike any I have seen, and certainly forms a new genus. The only variable characters seem to be in the last tarsal joint of the mid legs, which in some specimens is white, in others grey, and in others almost brown. The majority have the head scales showing brilliant mauve reflections, but in one they are mainly dull ochraceous.

Mr. Urich states in his letter that he has found the breeding-place of this handsome species, but gives no details.

They were taken at Aqua Santa, on a "Cocoa Estate" bordering on a forest. They are found in the cocoa groves, but do not come into the houses.

## SECTION D.

PROBOSCIS SHORT, NOT FORMED FOR PIERCING.

## SUB-FAMILY CORETHRINA.

1. Metatarsus longer than the first tarsal joint ..... Genus 21 *Corethra*
2. Metatarsus shorter than the first tarsal joint ..... Genus 22 *Mochlonyx*

## GENUS 21.—CORETHRA. Meigen (1803).

(Illig. Mag. ii. 260, pl. x. and Syst. Besch. Dipt. i. 14, 1, Meigen; Ins. Lapp. 808, 1, Zetterstedt; Hist. Nat. Dipt. i. 47, 1, Macquart; Bull. Soc. Imp. Nat. Mosc. iii. (1845), Gimmerthal; Faun. Germ. 109, 16; Panzer; Klass. Zweifl. i. 81, Meigen; Gen. Crust. iv. 247, Latreille; Dipt. Neer. p. 331, Van der Wulp; Ins. Brit. Dipt. iii. 250, Walker; Fn. Austr. Die Fliegen, Schiner, i.; Syst. Ent. iv. 246, 58 (*Tipula*), Fabricius; Anim. sans Verteb. iii. 444, 7 (*Tanypus*), Lamarck; Syst. Nat. v. 2826, 101 (*Tipula*), Gmelin; Ins. vi. 149, 20 (*Tipula*), De Geer.)

Mouth not formed into a piercing proboscis; rostrum short and broad with two rounded hairy terminal knobs; palpi about the same length in the male and female, four-jointed, joints hairy; antennae fourteen-jointed, about as long as the head and thorax, pilose in the ♀, very plumose in the ♂, slightly moniliform; verticillate hairs arising from the base of the upper third of the joints. Thorax oval, covered with long curved hair-like scales; scutellum not trilobed, as in the other *Culicidae* (except *Anopheles*), but simple, the posterior border uniformly curved; metathorax rather small, nude. Abdomen long, slender, often almost transparent, devoid of scales, but hairy; in the female the abdomen ends in two small curved blunt hairy processes; male genitalia provided with claspers. Wings with the veins as in *Culex*, but the first longitudinal is some distance from the costa, and the sub-costal ends much nearer the tip of the wing than in

that genus; fork-cells long; veins scaled with hairy scales, with a fringe composed of long and short lanceolate scales and

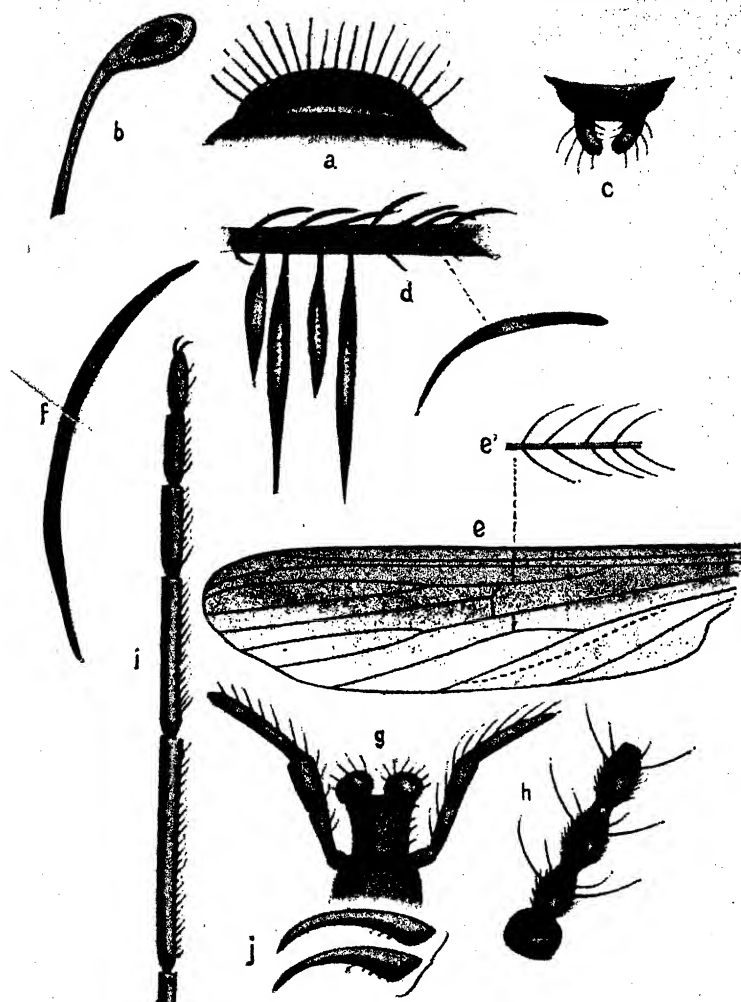


Fig. 294.

Genus *Corethra*.

a, Scutellum; b, haltere; c, female lamellae; d, wing border; e, venation, and e', scales of wing; f, enlarged wing scale; g, proboscis and palpi; h, basal joints of antenna (♀); i, metatarsal and tarsal joints; j, unguis of ♀.

numerous hair-like scales along the border, surface of the wing with minute curved hairs; border-scales shorter than those of the veins, the basal lobes of the wing (Fig. 295) are also character-

istic. Legs long, very slender, hairy, unarmed; unguis of female small, simple; the joints rather constricted.

The larvae of this genus live in almost any water, but prefer clear water, and are not infrequent in water containing fish, their clearness and transparency protecting them. A description of the larvae will be found on p. 34, Vol. I.

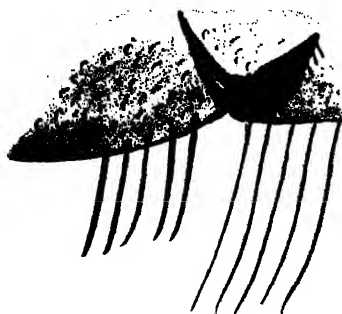


Fig. 295.

Base of the wing in *Corethra*.

None of *Corethra* have been recorded as causing any annoyance, the mouth parts not being drawn out into a proboscis as in other Culicidae. Their food consists mainly of vegetable substances. They mostly occur in the open country, but may sometimes be found in woods. Very seldom do they seem to enter houses. Damp and swampy places, especially along small

rivers and dykes, are their favourite localities. The European species are disposed to assemble in large companies, and may be seen in cloud-like masses, especially under sheltered banks, &c., where they are not affected by the wind. Some of the species (*C. culiciformis* and *C. plumicornis*) are double-hooded.

Fourteen species have so far been described, eleven of which occur in Europe. One species has been recorded from America (*C. punctipennis*, Say) and the West Indies; another species (*C. Maniliensis*, Schiner) has been found in the Philippines, one from India, and one (*C. Antarctica*) from New Zealand. I do not feel at all sure as to the validity of five of the European species, but not having seen the types I do not feel competent to express a definite opinion. I have only been able to examine and redescribe six of the fourteen species; the remaining eight species are given in the original description. One new species sent by Col. Giles from India is described, it being the only Asiatic form recorded, and another has recently been received from Dr. Lutz from Brazil.

*Corethra* evidently abounds in Central Africa, especially in the region of Lake Nyassa, for they are made into a cake called "Kunga cake" in that district (*vide* Proc. Ent. Soc. Lond. p. lvi. (1878), A. Eaton).

I have not noticed a single specimen of this genus in the

numerous collections sent to the Museum, but have received two specimens privately. So far, the genus *Corethra* seems to be chiefly confined to temperate regions, only four species being recorded from tropical or sub-tropical climates. This may be, however, because they have not been collected; being non-obnoxious, one would not expect to find them in the collections of mosquitoes sent by correspondents. Amongst these collections have been numerous *Chironomidae*, and I may, in separating them, have overlooked a *Corethra* or two, but I do not think so. There is some resemblance between *Chironomus* and *Corethra* generally, but they are soon separated when carefully examined. As I have seen so few species of this genus I have not attempted to tabulate them.

The known species are as follows :—

- C. nyblaei*. Zetterstedt.
- C. pilipes*. Gimmerthal.
- C. pallida*. Fabricius.
- C. flavicans*. Meigen.
- C. Asiatica*. Giles.
- C. punctipennis*. Say.
- = *C. trivittata*. Loew.
- C. culiciformis*. De Geer.
- C. fusca*. Staeger.
- C. plumicornis*. Fabricius.
- C. Maniliensis*. Schiner.
- C. rufa*. Zetterstedt.
- C. obscuripes*. Van d. Wulp.
- C. pallens*. Schiner.
- C. antarctica*. Hudson.
- C. Braziliensis*. n. sp.

Meigen also describes a species under the name *Corethra gibba*.

# 1. CORETHRA NYBLAEI. Zetterstedt.

*Erioptera nyblaei*. Zetterstedt.

*C. pilipes*. Gimmerthal (?).

(Fig. 131, Pl. XXXIII.)

(Ins. Lapponica, 830, Zetterstedt; Bull. Soc. Imp. Nat. de Moscow, xviii. p. 279 (1845), Gimmerthal.)

Thorax pallid, with two brown median lines ending about two-thirds of the way across the mesonotum and a broad brown line on each side on the posterior half reaching the scutellum. Abdomen pale steel colour, with chestnut and ferruginous marks, and a dark patch on each side which forms more or less a dark lateral line. Legs yellowish-brown, apices of tibiae, metatarsi

and tarsi dark. Wings with two long yellow spots on the costa.

♀. Head pale yellowish-brown, with long and short pale hairs; antennae brown, with dusky rings, basal joint pale ferruginous, next few joints yellowish, hairs brown; eyes black; proboscis and palpi pale brown, hairy.

Thorax pallid, with a double brown median line ending about two-thirds of the way down the mesothorax, and a broad brown line starting in the middle of the mesothorax on each side and ending at the scutellum, with longish brown curved hairs; scutellum pale ochraceous, with a border of brown bristles; metanotum deep chestnut-brown; pleurae pale chestnut-brown, with a grey sheen and a few dark patches.

Abdomen very pale shiny steel colour, with a few chestnut-brown or ferruginous marks and with a dark patch on each side, which together form more or less a lateral line; with minute dark brown puncta over the segments, and with long lateral hairs; on the posterior borders are also long hairs and short ones on the dorsum.

Legs pale yellowish-brown, with pale hairs and darker bristles, the apices of the tibiae, metatarsi and tarsi dark brown, the last two tarsal joints entirely brown; unguis apparently equal and simple, black.

Wings densely clothed along the veins with long hair-like scales pale brown in colour, those on the costa forming two long pale yellow patches on the apical half; the remainder dark brown; bases of the fork-cells and the cross-veins dusky, the scales also accumulating there and forming distinct dark brown spots; fork-cells of equal length, the base of the second posterior cell much nearer the base of the wing than that of the first sub-marginal; the stem of the second posterior cell carried past the marginal cross-vein into the basal cell; posterior cross-vein a short distance only behind the mid cross-vein.

Halteres yellowish-white.

Length.—6 mm.

Habitat.—Scandinavia.

Observations.—Redescribed from a single ♀ in Mr. Verrall's collection, from Bigot's collection. Zetterstedt says of the wings: hyaline grey, transverse veins obscure villous, so as to form a lunate band. This is one of the largest members of the genus. I strongly suspect Gimmerthal's *C. pilipes* is this species; the description is as follows:—

## CORETHRA PILIPES. Gimmerthal.

(Bull. Soc. Imp. Nat. de Moscow, p. 279.)

"Head and thorax brown; thorax with faint darker stripes, the middle one double, separated by a deep longitudinal line. Palpi and antennae brown. Abdomen greyish-brown, long hairs laterally, incisurae pale yellowish. Wings yellowish along the costa. Legs pale yellow; apices of tibiae and tarsi dark; legs with long hairs on the inner and outer sides; halteres dirty yellow.

"Length.—3 lines ( $\sigma$ ).

"Habitat.—Riga."

NOTE.—The hairs are pointed out as being the distinguishing character of the species; but they also occur in the type of *C. nyblaei* I have examined.

## 2. CORETHRA PALLIDA. Fabricius.

*Tipula pallida*. Fabricius*Chironomus pallidus*. Fabricius.

(Ent. Syst. Antl. iv. p. 245, Fabricius; Klass. *Chironomus pallidus*, "d. Zool." i. 34, Fabricius; Syst. Nat. v. 17, p. 2026, Gmelin; Fauna Germanica, cix. Meigen, Panzer; Fn. Austr. ii. 624, Schiner; Dipt. Neerland, 332, Van der Wulp; Ins. Brit. Dipt. iii. Walker; Dipt. N. Fr. 153, 3, Macquart; Dipt. Scand. ix. 3473, 3, Zetterstedt; Syst. Besch. i. 16, 2, Meigen.)

Thorax pale grey, with a pale brown patch on each side near the roots of the wings, and also a broad median line. Abdomen dull transparent white, with a narrow dark band on the hind border of each segment, with long flaxen hairs. Legs very pallid, banded with brown. Cross-veins brown.

$\delta$ . Head very pale brown; eyes deep purplish-black; antennae creamy, with dark brown bands at the verticils, basal joint creamy-white, with a dark spot on one side; plume-hairs pale flaxen; palpi delicate and brown, slightly hairy.

Thorax pale cinereous, with a clear pale brown patch on each side close to the roots of the wings, and a median line with very pale hairs on the middle line and around the bare space in front of the scutellum; scutellum very pallid, with dense long pallid hairs; metanotum pale chestnut-brown.

Abdomen transparent white, with a narrow black band on the hind border of each segment, with long pale flaxen hairs laterally and dorsally, as well as on the posterior borders of the segments; genitalia brown, basal joints long, claspers clear and pallid.



Legs very pallid, with nine brown bands on the femora and seven on the tibiae; remainder pallid.

Wings with the veins creamy-white, covered with long hair-like scales; the cross-veins brown.

Halteres pallid white.

*Length*.—4·5 mm.

*Habitat*.—Europe generally.

*Observations*.—Redescribed from a male in Mr. Verrall's collection. The female is slightly smaller than the male, but otherwise very similar. It is a very distinct and delicate insect. Apparently not a common species.

### 3. CORETHRA FLAVICANS. Meigen.

(Syst. Besch. p. 248 (1818).)

Meigen describes this species as :—

"Yellow, with the sides of the thorax whitish; clear yellow, almost sulphur yellow on the hairs of the antennae and legs.

"*Length*—of ♂ 2½ lines.

"*Habitat*.—Germany."

Col. Giles\* describes a specimen of this species in the collection at the Jardin des Plantes, labelled by Meigen, and states that the eyes, antennae, and palpi are all black, the thorax mainly chestnut-brown, with a fine median white line and two large round lateral snowy spots. Abdomen pale ferruginous, the fore borders of the segments being darker. Legs pale ferruginous, unadorned. Wings pale iridescent yellow, veins of the same colour; both fork-cells long and narrow, the first sub-marginal slightly the longer, their bases nearly opposite; stems of the fork-cells short and of equal length.

### 4. CORETHRA ASIATICA. Giles.

(*Entomologist*, July, p. 196, 1901.)

Of a pale straw colour. Thorax with a median dark brown line, broad in front, narrowing behind, and two lateral dark brown patches behind on the mesonotum, separated by black specks. Abdomen straw-coloured, with dusky specks laterally, and darker at the base. Legs stout, pale, darker towards their apices. Posterior cross-vein a little behind the mid cross-vein.

\* "*Handbook of Gnats*," p. 362.

♀. Head pale dusky-brown; eyes black; rostrum and palpi dusky-brown, hairy; antennae banded brown and grey.

Thorax dull greyish-brown, with a broad median dark brown line narrowing behind, and ending about two-thirds of the way across the mesonotum; on each side of the mesonotum behind is a large dark brown patch, commencing just before the median line ends, the pale intervening spaces with numerous dark specks, from which the long pallid hairs arise; these are also seen on the outer sides of the dark lateral spots, and on the paler areas in front of the mesothorax; scutellum pale brown, with numerous long pallid hairs; metanotum deep brown; pleurae with frosty grey sheen.

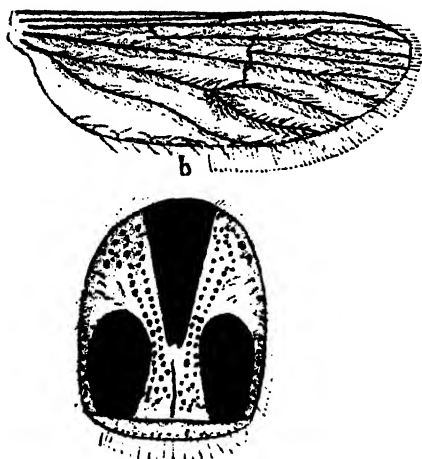


Fig. 296.

*Corethra Asiatica*. Giles.

a, Thorax; b, wing of ♀. (X. 9.)

Abdomen pale and translucent, ochraceous, the last two segments darker, densely pubescent; each segment has a narrow paler posterior border.

Legs pale, pubescent, slightly brown towards their extremities; unguis very small, equal and simple.

Wings pale ochraceous, with very long, thin, hair-like, pale ochraceous scales densely disposed along the veins; the first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem equal to about one-half the length of the cell; posterior of the second posterior nearly the length of the cell; posterior

cross-vein not quite half its length behind the mid cross-vein, the mid and the supernumerary meeting at an angle; the lower branch of the fifth markedly curved upwards towards the apex of the upper branch.

Halteres pale ochraceous.

Length.—2.3 mm.

Habitat.—Shajahanpur, N. W. P., India (Giles).

Observations.—Described from the type sent me in Lieut.-Col. Giles's collection (a single female).

It was taken by him in his dining-room, on the wall beneath a lighted lamp. No more specimens could be found.

The thoracic ornamentation is very characteristic. It is the only Asiatic *Corethra* yet recorded.

#### 5. CORETHRA PUNCTIPENNIS. Say.

*C. trivittata*. Loew.

(Journ. Acad. Nat. Sci. Philadelphia, iii. 16, Say; Ent. Zeitung Stetin. p. 338 (1885), Von Röder.)

"Pale yellowish, with fuscous hairs; antennae banded black. Thorax with three yellowish-brown stripes, the middle one narrower behind than in front, the lateral ones smaller in front, expanding posteriorly; metanotum black; scutellum fuscous at the sides; abdomen with black bands. Legs pale yellow; metatarsus fuscous at the apex, also the apices of the femora and bases and apices of the tibiae banded black. Wings transparent, with brown spots."

Length.—2½ lines.

Habitat.—Pennsylvania (Say); Maine (Osten-Sacken); Porto Rico (Von Röder.)

NOTE.—Compiled from Say and Loew's descriptions.

#### 6. CORETHRA CULICIFORMIS. De Geer (1776).

*Tipula culiciformis*. De Geer.

(Mém. pour serv. à l'Hist. d'Ins. vi. 372, De Geer; Hist. Nat. Cr. et Ins. xiv. 288, Latreille; Dipt. Besch. i. 16, 2, Meigen; Hist. Nat. Dipt. i. 47, 2, Macquart; Regn. Anim. (2nd edit.) v. 441, Latreille; Gen. Crust. iv. 247, Latreille; Anim. sans Vert. iii. 443, 1, Lamarck; Ins. Brit. Dipt. iii. 251, Walker; Fn. Austr. ii. Schiner; Overs. K. Dansk Vidensk. Selsk. p. 16 (1883), Meinert.)

Head chestnut-brown; rostrum brown, with dark hairs; palpi dark brown, with dark brown hairs; eyes black and

silvery; antennae pale ochraceous, with scarcely any trace of banding and dark verticillate hairs.

Thorax pale grey, with two broadish chestnut-brown median lines separated by a narrow pale line, with two broad lateral lines on the posterior half of the mesothorax, the space between them and along the sides and between the two median lines

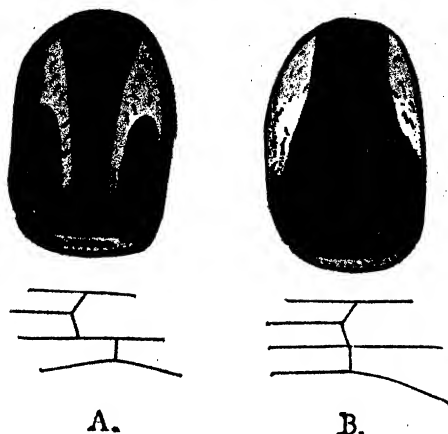


Fig. 297.

A, Thorax and cross-veins of *Corethra plumicornis*;  
B, of *Corethra culiciformis*.

chestnut-brown; golden-brown bristles over the roots of the wings and narrow curved hair-like scales on the mesonotum; scutellum pale ochraceous, with a compound border of golden-brown bristles; metanotum chestnut-brown, with darker centre; pleurae pale ochraceous.

Abdomen pale yellowish to testaceous-brown, with long golden hairs, posterior borders of the segments with a narrow dark rim.

Legs ochraceous, with dark hairs, slightly dusky on the tarsi: unguis equal, small, and brown in the ♀.



Fig. 298.

*Corethra culiciformis* (♀). (X. 9.)

Wings with a yellowish tinge, with dull yellowish hair-like scales and yellow veins; the posterior cross-vein on a level with the mid cross-vein; the first sub-marginal cell a little longer and

narrower than the second posterior cell. Halteres all pale ochraceous; a dusky spot at the base of the wing.

*Length*—of ♀ 4 to 4·8 mm.

*Habitat*.—Europe generally.

*Observations*.—This species is very like *C. plumicornis*, but the posterior cross-vein is always level with the mid cross-vein, not distant from it as in that species. The thorax has also chestnut-brown colour surrounding the four dark lines, the whole forming a broad V-shaped dark mesothoracic mass with the apex of the V pointing forwards.

7. CORETHRA FUSCA. Staeger (1839).

(Naturk. Tijdskr. Bd. ii. p. 556.)

(Fig. 130, Pl. XXXIII.)

Thorax dusky-grey, with a median dark line and broad converging, lateral lines on each side and two dark patches on the basal half of the mesonotum. Abdomen dark brown, rather paler at the bases of the segments; densely hairy. Legs dull ochraceous.

♂. Head brown; rostrum and palpi brown, with dense long brown hairs; antennae brown, slightly ferruginous towards the base, with dark brown bands; plumes flaxen-brown.

Thorax with dusky-grey sheen, with a narrow median dark line and a broad converging lateral line on each side, curved down in front; two dark patches outside on the basal half of the mesonotum; sides of the thorax in front reddish-brown, with pale hairs; scutellum paler, ferruginous; metanotum black; pleurae pale brown and black.

Abdomen dark brown, the bases of the segments rather ferruginous, in certain lights catching the rays so as to appear irregularly white banded; densely hairy; venter brown, with paler basal bands.

Legs pale ochraceous, densely hairy, the apical tarsi rather darker; ungues equal and simple.

Wings with the veins pale brown, with rather long pale brown scales; first sub-marginal cell longer and narrower than the second posterior cell, its base a little nearer the base of the wing than that of the second posterior cell; posterior cross-vein longer than the mid cross-vein, only a short distance nearer the base of the wing. Halteres pale.

*Length*.—5·5 mm.

*Habitat*.—Denmark (Staeger).

*Observations*.—Redescribed from a male specimen in Mr. Verrall's collection. It is a very distinct species, easily identified by its dark colour.

8. *CORETHRA PLUMICORNIS*. Fabricius (1792).

*C. lateralis*. Latreille.

*C. hafniensis*. Gmelin.

*C. crystallina*. De Geer. (?)

(Ent. Syst. iv. 246, 58, Fabricius; Syst. Besch. Dipt. i. 15, 1, Meigen; Ins. Lapp. 808, 1, Zetterstedt; Bull. Soc. Imp. Nat. Mosc. (1845), iii. 296, 1, Gimmerthal; Hist. Nat. Dipt. i. 47, 1, Macquart; Faun. Germ. 109, 16, Panzer; Klass. Zweif. i. 81, Meigen; Ins. Brit. Dipt. iii. 251, Walker; Fn. Austr. ii. Schiner; Gen. Crust. iv. 247 (= *C. lateralis*), Latreille; Syst. Ent. iv. 246, 58 (*Tipula plumicornis*), Fabricius; Ins. vi. 149, 20 (= *T. crystallina*), De Geer; Syst. Mat. v. 2826, 101 (= *T. hafniensis*), Gmelin; Anim. sans Verteb. iii. 444, 7 (= *Tanytus lateralis*), Lamarck).

Head deep testaceous; eyes black; rostrum dark brown, hairy, hairs long and dark; palpi dark brown; antennae pallid, with brown bands above the verticils.

Thorax pale yellowish-brown, with two broad, dark, chestnut-brown median bands with a yellowish hue between, not quite reaching the scutellum, and one darker lateral line on each side of the mesonotum on its posterior half; these broad lines have a darker border and dark cross-bars in some specimens; thorax ornamented with long, curved, pallid hairs and bright brown bristles over the roots of the wings; scutellum bright testaceous, with a compound row of border-bristles, golden-brown in hue; metanotum deep chestnut-brown, with a deeper mark in the middle, spreading out basally; pleurae pale yellowish.

Abdomen pallid brown to pale yellowish grey, with a slightly darker narrow apical border and with bright deep brown hairs which are long laterally.



Fig. 290.  
*Corethra plumicornis* (♀). (X. 9.)

Wings with a faint yellowish tinge, with yellowish veins and long hair-like dull yellowish scales; first sub-marginal cell

narrower and a little longer than the second posterior cell, their bases nearly level, their stems equal, both very short; posterior cross-vein nearly its own length distant from the mid cross-vein. Halteres pale ochraceous. Legs yellowish-brown, pallid, with long hairs; ungues of the ♀ equal and simple.

*Length*.—6 mm.

*Habitat*.—Europe.

*Observations*.—As far as general appearances go this species resembles *C. culiciformis*, but it can at once be separated by the posterior cross-vein being distant from the mid cross-vein, whilst in *C. culiciformis* it is level with the mid cross-vein.

#### 9. CORETHRA MANILIENSIS. Schiner.

(Reise der Novara Diptera, p. 30.)

"Head yellow; antennae yellow, with black rings; plumes pale brownish-yellow, palpi clear yellow. Pale reddish-yellow on the thorax, with three darker coloured longitudinal stripes, the middle one diffuse in front, clearly defined behind; scutellum with a clearer median line. Abdomen shiny, with delicate long hairs, the last two segments brownish. Legs pale yellow, almost white, the tibia fringed with long fine hairs. Wings yellowish, with tawny-yellow veins, which are thickly fringed; fork of the marginal veins longer than that of the discoidal veins.

*Length*.—2 lines.

*Habitat*.—Manila."

NOTE.—Compiled from Schiner's description.

#### 10. CORETHRA RUFA. Zetterstedt.

(Ins. Lapponica, 808.)

"Rufous, with obscure brown marks on the thorax, dorsum of abdomen fuscous; legs yellow.

"♀. Like *C. plumicornis*, F., but entirely fusco-testaceous. Thorax with a double median stripe and an ovate spot on each side, of a bright brown colour; abdomen fuscous above, with a median testaceous line at the base, sometimes extending beyond the middle, pubescent; venter pale. Legs yellow, apices of the femora, tibiae and tarsi fuscous, sometimes spotless. Wings pale, with villous veins; halteres pale.

*Length*.—3 lines.

*Habitat*.—Lapland."

*Observations*.—There seem to have been no recent records of this species.

11. *CORETHRA* *OBSCURIPES*. Van der Wulp.

(Tijdschr. v. Ent. ii. 1601, et Dipt. Neerlandica, p. 333.)

"Like *C. rufa*, but darker in colour. Thorax ash-grey, with dark brown lines, a lateral line between the neck and root of the wings, narrow, pale grey; scutellum brownish; abdomen dark brown, with greyish incisions.

"Legs brownish-grey; coxae and bases of the femora yellowish; hairs on their venter brown; wings of a grey tint, with pale brown veins; halteres yellow."

*Habitat*.—Holland (Van der Wulp).

*Observations*.—This species can be told from *C. culiciformis* by not having yellowish hairs on the abdomen, and from *C. fusca* by the brownish-grey, not yellow, legs as in *C. fusca*. (F. V. T.)

12. *CORETHRA* *GIBBA*. Meigen.(Nouveau Dict. d'Hist. Nat. Art. *Corethra*.)

"Green, with the wings white, marked with an obscure band."

NOTE.—This is all I can find about this species, which should, however, easily be identified if a true *Corethra*.

13. *CORETHRA* *PALLENS*. Schiner.

"Very like *C. Maniliensis*, only the legs are not uniformly coloured."

14. *CORETHRA* *ANTARCTICA*. Hudson.

(Manual Ent. N. Zealand, p. 43, pl. iv. fig. 3.)

Hudson figures this species in his "Manual of New Zealand Entomology," but gives no description except that it is "an elegant little gnat frequenting the margins of ponds and ditches during the spring months."

Regarding the larva and pupa, he writes as follows:—

"The larva is bright green, ornamented with numerous yellow spots; it is very sluggish, living in the green slime weed which floats on the water in such large masses during that season. Not being very common it is difficult to find, as its colour so closely resembles that of the weed which it always frequents. The pupa is not very agile, and is nearly



always observed suspended from the surface by its thoracic air-tubes and caudal fins, the abdomen being directed upwards, and thus bringing the two pairs of organs close together."

NOTE.—Judging from the figures of larva and pupa (pl. IV. 3a and 3b), I should not say it was a true *Corethra*; in any case it differs materially from our European types. The figure (3) of the adult, however, shows typical *Corethra* thoracic ornamentation, and the wings have three dusky patches on the border.

CORETHRA BRAZILIENSIS. n. sp.

Legs banded black and white. Wings with some brown spots.

♀. Thorax and abdomen greyish-brown; hairy.

Wings with the fringe abnormally long; first sub-marginal cell considerably longer but about the same width as the second posterior, their bases about level; stem of the former one-third the length of the cell, of the latter nearly half the length of the cell; posterior cross-vein about half its length distant from the mid cross-vein; at the base of the fork-cells runs a broad dusky-brown patch, which sends out a branch on each side, forming a broad dusky patch on each side of the posterior cross-vein which bend down to the border of the wing.

Legs with the femora and tibiae banded with brown and white, and with the metatarsi and tarsi with basal white bands; in the hind legs the femora have seven small black bands, and the apex broadly deep brown, the tibia also with seven dark bands, including the apical one, the metatarsus banded white in the middle, not at the base; in the fore legs there are only six black bands to the tibiae and the metatarsi are basally white; legs densely hairy; unguis small, equal and simple.

Length.—2 mm.

Habitat.—Brazil (Dr. Lutz).

Observations.—Described from a single specimen damaged in transit, but very distinct and easily identified from the wings being spotted and the markedly banded legs as in our European species.

It is the only specimen of *Corethra* yet taken in South America.

I cannot make it either Say's *C. punctipennis* nor Loew's *C. trivittata*. No mention is made of the number of bands on the

legs of Say's or Loew's species, merely "legs with numerous brown dots"; "the first tarsal joint fuscous at the apex, apices of the femora and bases and apices of the tibiae banded black, &c." And as the species of *Corethra* seem very restricted in habitat, I think it is best to describe this small gnat as a new species, until Say's type or specimens from Pennsylvania can be obtained.

GENUS 22.—**MOCHLONYX**. Loew (1844).*Corethra* Ruthe.

(Ent. Zeit. Stett. v. 121, Loew; Ins. Brit. Dipt. iii. 252, Walker.)

Proboscis short in the male and female, a little longer than the head. Palpi twice as long as the proboscis, four-jointed; antennae fifteen-jointed, the last two joints longest and verticillate, joints increasing in size from the base to the apex. Wings with the cross-veins nearer the base of the wing than in *Corethra*; fork-cells long, the stems short, much less than half the length of the cells, veins otherwise much as in *Corethra*. *The legs have the first tarsal joints always longer than the metatarsi, unguis moderately large, serrated.*

There have been two species of this genus described, both from Europe. The two species are recorded in England, *M. velutinus*, Ruthe, and *M. effoetus*, Haliday. I believe these two to be the same.

Although the adult resembles chiefly *Corethra*, the larva most nearly approaches the *Culex* type, being provided with a respiratory siphon (*vide* p. 49, Vol. I.).

1. **MOCHLONYX VELUTINUS**. Ruthe.*M. effoetus*. Walker. (Haliday MS.)(Isis. 1205 (1831), Ruthe; Ins. Brit. Dipt. iii. p. 252 (*effoetus*), Walker.)

(Pl. 132, Pl. XXXIII.)

Head, antennae and palpi brown, antennal plumes of the ♂ yellowish-brown to flaxen.

Thorax dark brown, with golden-yellow hairs and two closely applied longitudinal median stripes; scutellum and metathorax brown.

Abdomen pale yellowish-brown, with transverse brown stripes, which nearly cover the hind segments, apical segment all brown.

Legs yellow ; tarsi brown ; unguis dark brown.

Wings with golden-yellow veins clothed with scales.

*Length*.—5 mm.

*Habitat*.—Europe.

*Observations*.—This dark species can at once be told by the long first tarsal joint. There are specimens in the British Museum collection, and Mr. Bignell has also specimens. Beyond these I do not know of its existence in English collections. Haliday described in MS. a species under the name *M. effoetus* from four females in Mr. Clifton's collection. I do not know what has become of the types. The description is given by Walker (Ins. Brit. Dipt.). I fancy, however, that Haliday's species is *M. velutinus*. His original description is given below :—

**MOCHLONYX EFFOETUS.** Walker. (Haliday MS.)

“Brownish-red, with yellowish down; almost of a golden gloss; front thickly clothed with yellow hairs; palpi fuscous; antennae fusco-ferruginous, paler at the base; sutures of the thorax delicately marked with fuscous; hinder edge of the abdominal segments and lateral lines darker; pleurae paler. Wings hyaline, a little yellowish towards the costa; veins pale, fusco-ferruginous; halteres pale, with fuscous at the tip; legs pale ferruginous, with fuscous hairs; hind femora slightly embrowned before their tips.

“*Habitat*.—England.”

# APPENDIX.

## GENUS ANOPHELES. Meigen.

(Page 115, Vol. I.)

### ANOPHELES PSEUDOPUNCTIPENNIS. n. sp.

WINGS much as in *A. punctipennis*, Say, but the fringe with yellow spots. Legs long, unbanded, brown, pale at the base. Fore unguis of ♂ unequal, mid and hind equal and simple.

♀. Antennae brown, basal joint testaceous, base of the second joint pale, and also a small pale band at the base of all the following joints; proboscis dark brown, labella yellowish; palpi dark brown, densely scaled at the base, apex yellow, and also two narrow yellow bands below, slightly hairy, hairs black, except at the apex, where they are yellow; clypeus dark brown.

Thorax yellowish-brown (denuded), with a dark patch on each side of the mesonotum behind; metanotum deep brown; pleurae yellowish-brown, with darker brown patches.

Abdomen brown, the segments paler at the base; hairy.

Legs deep brown; coxae, trochanters and base of femora pallid; knee spot pale; unguis equal and simple.

Halteres with pale stem and fuscous knob.

Wings with two yellowish-white spots on the upper costal border, rest of the edge black, rather densely scaled; first submarginal cell longer and narrower than the second posterior cell, its stem nearly as long as the cell; mid cross-vein a little nearer the base of the wing than the supernumerary cross-vein; posterior cross-vein still nearer the base of the wing; scales of the wings disposed as follows:—First long vein with three distinct large white spots, one at the base, one underneath the large costal spot, and one between; second long vein with a dark patch near its base, all the lower branch of the fork-cell dark, and most of the upper; third long vein mostly yellowish-white, with two black patches, one towards the base, the other towards the tip; fourth long vein mostly pale, with two small black patches, branches of the fork-cell all dark scaled; fifth long vein with a black spot near the base, rest mostly yellow, upper branch of the fork mostly dark, a small yellow spot at the apex and

another towards its base, lower branch mostly yellowish, with a black apical spot; sixth vein with the basal half creamy, the apical half dark, except a small yellow patch where it joins the wing border; fringe brown, with a yellow spot at the junction of each vein.

*Length*.—5 mm.

♂. Last two joints of the palpi swollen and clavate, pale, basal joints dark brown, densely scaled with deep brown scales, with a narrow pale band, not quite as long as the thin proboscis, which is brown, with yellow labellæ; antennæ grey, with narrow brown bands and flaxen brown hairs, the apical joint about half the length of the penultimate joint; basal lobe of the genitalia simple, claspers long and thin; fore unguis unequal, the larger one uniserrated, the smaller minute and simple; mid and hind unguis small, equal and simple.

Wings much as in the ♀, but the fork-cells shorter.

*Length*.—5 mm., with proboscis 7.5 mm.

*Habitat*.—Grenada (Dr. Hatton, per Dr. Daniels).

*Time of capture*.—February.

*Observations*.—Very like *A. punctipennis*, Say, but can at once be told by the wing fringe being spotted at the apex of each nerve, and by the marking of the sixth long vein. The description is drawn up from two specimens in balsam, so that the scale structure is not evident. It is so very distinct, however, that it can easily be identified by the characters given above.

#### ANOPHELES OCELLATUS, mihi.

This name must sink as a synonym, as Dr. Dönitz has described this species under the name *A. Kochi* whilst this work was in the press (*vide* Insecten Börse, 5. Jahr. 18. 31. Jan. 1901, p. 36). The name has been altered in the text, but *ocellatus* may occur elsewhere.

*Localities*.—Sumatra (Padang), and Java (Serang und Tjimahi).

#### ANOPHELES TESSALLATUS, mihi.

This name must also sink as a synonym, as Dr. Dönitz describes it in the same paper quoted above (p. 3), as *Anopheles punctulatus*.

*Localities*.—Sumatra (Kajoe Janam), Borneo (Moearah Teweh).

Like the above the name has been altered in the text, but correspondents may have my MS. name.

## ANOPHELES LEUCOPUS. Dönitz.

(Insecten Borse, 5. Jahr. 18. 31. Jan. 1901, p. 37.)

Dr. Dönitz describes *A. fuliginosus*, Giles, under this name, from Java, Serang; Batavia (Ravan Tanah); Sumatra; Padang; Doerian.

This name must therefore sink as a synonym of *A. fuliginosus*, Giles.

## ANOPIELES PLUMIGER. Dönitz.

This is either *A. barbirostris*, Van der Wulp, or *A. sinensis*, Wied. Dr. Dönitz sends me three specimens under this name, one is a true *barbirostris*, the other two *A. sinensis*.

*A. plumiger*, Dönitz, then stands as a synonym of one or other of these species.

## ANOPHELES LEUCOPHYRUS. Dönitz.

(Insecten Borse, 5. p. 37, 1901.)

Thorax bright chestnut-brown in front, darker behind, with two dark eye-like spots and a dark median line. Abdomen dark brown. Legs brown; femora and tibiae with small yellow specks, fore legs unbanded; mid tarsi apically and basally banded, hind legs with a very broad white band involving both sides of the tibio-metatarsal joint; tarsi with narrow apical bands. Wings with four large and three small black costal spots and with numerous black spots of scales along the veins.

♀. Head dark brown (partly denuded), nape with large black upright forked scales, a tuft of white hair-like scales projecting forward; antennae brown; basal joint bright testaceous brown; palpi densely covered with brown scales, with traces of two apical pale bands; clypeus pale chestnut brown; proboscis brown.

Thorax bright chestnut-brown in front, darker behind, with two dark eye-like spots on the paler area and a dark median line; a few pale scales projecting over the head (remainder denuded); pleurae dark brown; scutellum dark chestnut brown in the middle, pale ochraceous at the sides; metanotum deep shiny chestnut-brown.

Abdomen deep brown with pale golden hairs (denuded).

Wings with the costa with four large dark brown spots and three smaller ones, separated by small creamy-yellow spots; these spots are arranged as follows:—a small pale spot at the apex, then a long brown one, then another small pale spot,

followed by a very long brown one separated from the next by a small pale area where the sub-costal joins the costa; the next brown spot is large and very marked, extending on to the first and second long veins; next to this is a very small black spot with a similar sized pale area on each side and then a larger black area, followed by two smaller black patches separated by small pale spots; the two apical dark patches extend into the first long vein, which is pale at the apex; the second long vein is mostly dark scaled, but the upper branch of the fork is pale at the tip and there is a pale area on each branch towards the base and a small spot at the base and another at the stem; the third long vein has seven black spots, one being apical; the fourth is mostly dark scaled; the stem being particularly so, a small pale spot on each branch of the fork and another at its base; fifth long vein with its upper branch mostly black scaled, broken by seven small pale spots, one apical; the lower branch with three prominent black patches, base of the fork pale, stem with six black spots; sixth long vein with seven black spots, separated by creamy scaled areas, fringe brown with pale spots at the apices of the veins except at the sixth.

Halteres densely scaled, silvery to creamy white.

Legs deep brown; femora and tibiae with yellow specks; metatarsi and tarsi of the fore legs with pale bands involving both sides of the joints of the tarsi; mid legs unbanded; hind legs with a very broad almost white band involving both sides of the tibio-metatarsal joint, tarsi with narrow pale apical bands; apex of hind tibiae much swollen; ungues equal, simple, small.

Length.—5 mm.

*Habitat*.—Sumatra (Kajoe Janam); Borneo (Mocarah Teweh).

*Observations*.—Described by Dr. Dönitz during the present year. A very distinct species related to *A. punctulatus*, Dönitz, but easily separated from it by the very marked pale tibio-metatarsal band and the prominent median dark costal spot.

The description here is drawn up from a ♀ kindly sent me by Dr. Dönitz. The ♂ is unknown.

#### ANOPHELES GIGAS. Giles.

(Ento. Mo. Mag. p. 196, vol. xxxvii. 1901.)

Thorax fawn coloured in the middle, dark brown on each side; abdomen dark brown; legs dark brown with basal pale bands, pale at the base; wings with two large black spots along the costa and black patches on the wing field; fringe with pale areas.

♀. Head brown grey in the middle; proboscis long, deep brown, curved; palpi long with deep brown scales rather thin, not quite as long as the proboscis; antennae pale brown.

Thorax pale fawn coloured in the middle; dark rich brown on each side, and a narrow thin dark median line, the middle area with frosty grey tomentum and narrow curved hairs; scutellum pale; metanotum chestnut-brown.

Abdomen deep brown with long golden-brown hairs. Wings large, the costa black with three creamy spots, the black forming two large black spots which extend over the first long vein and the upper branch of the second and base of fork-cell, there is also a black patch on the lower branch of the sub-marginal cell, and two on the stem, one basal; a small dark patch at the base of the third long vein, all the rest creamy-yellow; a black patch at the apex of each branch of the second posterior cell and another at the base of the cell, greater part of the stem dark scaled; three black patches, the median one large, on the upper branch of the fifth vein, base of the fork dark, and another dark patch towards the base of the vein; sixth vein mostly black scaled with a median pale patch; fringe pale where the veins join the border of the wing, except at the ends of the fifth vein, which have no pale fringe spot, but a pale area between the two branches; supernumerary cross-vein nearer the apex of the wing than the mid cross-vein, the posterior cross-vein nearly three times its length distant from the mid cross-vein.

Halteres with dense black knob.

Legs long, with the coxae and trochanters pale, almost white, remainder deep brown with traces of basal pale banding especially to the metatarsi and tarsi of the hind legs.

Length.—5 to 5.5 mm., of wings 6 mm.

♂. Apices of the palpi pale, a narrow pale band towards the base; wings paler than in the ♀.

Length.—6 to 7 mm.

Habitat.—Conoor, Nehilgerri Hills, India.

Observations.—A very large and handsome species with wings somewhat like *A. punctipennis* and *A. crucians*, but the two black spots on the costal border very prominent. Colonel Giles has presented the types to the Museum. The specimens were sent to him by Dr. Price, I.M.S., from Conoor, where the species appears fairly common, but does not appear to occur on the plains, Conoor lying at an elevation of 6,000 feet above the sea level.

#### ANOPHELES CULICIFACIES. Giles.

(Ento. Mo. Mag. p. 197, 1901.)

Thorax brown, darker brown at the sides, abdomen brown, with deep brown apical bands and slightly darker at the sides, and pale basal patches on the apical segments; legs dark brown, unbanded; wings with four almost equal sized pale spots on the



costal border, and one smaller basal one; veins mostly dark scaled, with a few pale spots.

♀. Head brown, with numerous upright grey and brown forked scales; antennae brown, basal joint testaceous; proboscis brown; palpi thin, brown, with two narrow pale bands and a pale apex, with yellow bristles.

Thorax chestnut-brown, rather darker brown at the sides, and with numerous narrow golden-brown curved hairs; scutellum pale brown; metanotum chestnut-brown. Abdomen dark brown, with pale basal patches on the last few apical segments, with traces of darker apical banding; venter paler brown, hairs on all the segments laterally and dorsally.

Legs unbanded, dark brown, coxae and trochanters pale brown. Wings with four large equidistant and nearly equal sized black costal spots, and one smaller basal one, separated by pale creamy areas, the dark spots extend into the first long vein, most of the veins dark scaled, a small pale patch at the bases of the fork-cells, one on each branch of the fifth near the base of the fork, another long pale-scaled area at the base and one at the base of the sixth; lateral scales long and thin; fringe dark brown, unspotted. Halteres with pale stem and fuscous knob.

*Length*.—3·8 mm.

♂. Palpi brown, the last two joints swollen, the penultimate and antepenultimate with apical pale bands, the latter with a narrow median pale band; the apex of the antepenultimate and the penultimate joint with golden-brown hair-tufts, the apical joint with short dark bristle-like hairs. Antennae almost grey, with flaxen plume-hairs. Fore unguis unequal, the larger unserrated, the smaller simple, mid and hind equal and simple.

Genitalia testaceous brown; basal lobes narrow and curved, with golden bristles apically, and numerous small black bristles at the sides, claspers long and thin, expanded apically into a quadrangular knob.

*Length*.—3·5 to 4 mm.

*Habitat*.—Hoshangabad (Central Provinces), and the Berars, India.

*Time of capture*.—February.

*Observations*.—Described by Colonel Giles, who has presented the types to the Museum. It is a very distinct species, in which the male genitalia is very peculiar. This *Anopheles* has also abnormal habits, for when resting it assumes exactly the position of *Culex*. Colonel Giles says of this species, "When at rest this mosquito presents a close resemblance to *C. fatigans*, Wiedemann, as, apart from the conspicuous abdominal banding, the female habitually sits humped up like a *Culex*, while even the males keep the body no more than parallel to the surface they rest on." Evidently when fresh the abdominal banding is more distinct,

for Colonel Giles says, "abdominal segments conspicuously basally banded with yellowish, being in the fresh state completely clothed with yellowish and deep-brown scales."

ANOPHELES LISTONI. Giles.

(Ento. Mo. Mag. p. 197, 1901.)

"Wings with the costa black, including the actual base, with four yellow spots distinct, but much smaller than the intervening black portions, the largest light area being that quite at the base; there is also an apical spot; the remaining long veins are nearly black, but all of them show short lengths of white scales, and a line of these over the cross-veins, combined with one of the costal spots, forms a distinct light stripe across the wing. The fringe is dark, except at the apex, and indistinct paler patches opposite one or two of the longitudinal junctions. Tarsi dark unbanded. Thorax and abdomen much as in *A. funestus*, Giles. Head black, with a robust frontal tuft, forked scales mostly dark in the ♀, but with many white ones behind in the ♂. Palpi of ♀, black, with two narrow rings and a minute tip of white, slightly shorter than the proboscis; those of the ♂, as long as the proboscis, black-tipped, but with two whitish bands.

"This species a good deal resembles *A. funestus*, but has an additional white spot close to the base of the costa, and there are no shapely defined interruptions of the internal wing-fringe, as in that species.

"Length.—3.5 to 4 mm.

"Habitat.—Ellichpur, in the Berars, India."

NOTE.—I have only made a rough examination of this species, it seems clearly distinct. The description is the original one given by Colonel Giles.

ANOPHELES THEOBALDI. Giles.

(Ento. Mo. Mag. p. 198, 1901.)

"♀. Wings jet black, with the costa interrupted by five obvious white spots, the basal dots being nearly as large as the spots further out; in addition there is an apical spot, and the other long veins, though mainly black, are elaborately marked with white lengths, and the fringe is interrupted at the junctions of all the long veins and their branches. The last two hind tarsal joints, with the apices of the other three, are pure white; and the first two of the mid and the first three of the fore tarsals are apically white banded. The thorax and scutellum are sooty grounded with broad lines of white scales, two lateral and two sub-median.

"Abdomen sooty, nude, with brownish hairs. Head is black with a bifid frontal tuft, the nucleal crown white, and the nape black scaled. Antennae black, with whitish verticils. Proboscis sooty. Palpi intensely black, with the whole terminal joint and minute apical rings on the next three joints, snowy white. Halteres with white stems and black knobs. Legs brindled, with white scales throughout, the white preponderating on

the lower surfaces, with white knee spots and a large sub-apical white patch on the femora, the tibiae and first tarsal joints elaborately white-ringed, especially so on the mid legs.

"Length.—About 3 mm.

"Habitat.—Ellichpur, in the Indian Berars (Liston), and Shahjahanpur, N. W. P. (Giles)."

NOTE.—This species was taken by Lieut.-General Liston, I.M.S., and was described by Colonel Giles, who has presented it to the Museum.

It comes near *A. Jamesii*, Theobald, but can at once be told by having two instead of three of the hind tarsal joints all white, and the wings are darker, and the second long vein is entirely black.

### GENUS CYCLOLEPPTERON. Theobald.

(Journ. Trop. Med. iv. 14, p. 234, 1901.)

The species referred to on page 205, vol. i., as *Anopheles Grabhamii* presents such marked differences in the wing scales to any of the true *Anopheles* that it is clearly sufficiently marked to separate as a distinct genus.

The characters of the genus are as follows—Palpi long in both sexes, about as long as the proboscis; in the ♂ the last two joints are swollen, forming a spatulate extremity, in the ♀ they are subulate. The venation is very similar to a typical *Anopheles*, but the wings have, in addition to typical *Anopheles* scales, patches of large jet black scales, more or less inflated, and with their free end of a circular outline—these patches giving the wing a markedly spotted appearance. The typical lanceolate scales are comparatively few in number.

#### *The larvae of C. Grabhamii.*

Dr. Grabham sends specimens of the larvae of this species and writes that, "I observed two unusual *Anopheles* larvae in one of my breeding jars. These were isolated, and subsequently developed into *A. Grabhamii*. These larvae," he says, "in their later stages are at once distinguished from those of *A. argyrotarsis*, sub sp. *albipes*, by having a continuous brilliant white band along the median dorsal line, extending from the respiratory stigmata forwards on to the thorax; this character renders them most conspicuous when examined by reflected light on the surface of the water. The colour of the larvae is dark brown.

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GENUS **STEGOMYIA.** Theobald.

(Page 233, Vol. I.)

**STEGOMYIA IRRITANS.** Theobald.

(Rept. Liverpool School Trop. Med. p. iii. App. 1901.)

Head black and grey, the black forming a triangular patch in the middle and on each side. Thorax chestnut-brown, with deep brown scales and bright scanty golden scales. Abdomen dark brown, with narrow basal white bands. Legs dark brown, unbanded.

♀. Head covered with flat creamy-grey and black scales, the black ones forming a more or less triangular patch on each side, and a dark area in the middle, a few scattered black upright fork scales over the occiput, around the eyes a narrow line of curved golden scales; clypeus black, apparently nude; palpi testaceous, with dark scales; antennae dark brown, with

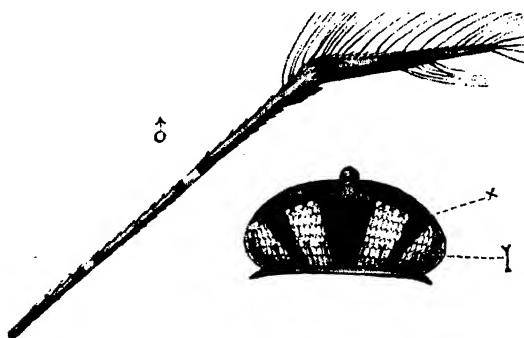


Fig. 300.

*Stegomyia irritans.* n. sp.

Head of ♀ and ♂ palp.

narrow pale bands, basal joint half testaceous, the inner half darker, base of the second joint testaceous, basal joint with a few small scales on the inner side and minute curved hairs; proboscis deep brown; eyes black and golden.

Thorax deep chestnut-brown, with narrow curved deep brown scales and ornamentation of similar bright golden ones, the latter most prevalent over and in front of the roots of the wings; scutellum brownish, with flat black scales on the middle lobe, narrower rather curved creamy ones on the lateral lobes, and with deep brown border-bristles; metanotum brown; pleurae brown, with large patches of creamy scales.

Abdomen deep blackish brown, with narrow white basal bands, first abdominal segment rather ochraceous, covered with dusky black scales and pale brown hairs; posterior border-bristles chestnut-brown, alternating long and short; venter mostly creamy-white, with narrow dark apical bands to the segments; the dorsal white bands form more or less white lateral spots.

Legs dark brown, pale at the base, femora grey ventrally, femora, tibiae and metatarsi spiny; fore and mid ungues equal, uniserrated; hind equal and simple.

Wings with the fork-cells rather short; scales brown; first sub-marginal cell very little longer and slightly narrower than the second posterior cell, their bases about level, stem of the former equal to about half the length of the cell, of the latter nearly two-thirds of its length; posterior cross-vein a little more than its own length distant from the mid cross-vein.

Halteres ochraceous, with pale scales over the knob, and dark ones on one side.

*Length*.—3 mm.

♂. Antennae black, with dense black plumes; palpi pale ochraceous, densely covered with black scales, the antepenultimate joint with two narrow pale rings; apical joint small, a little more than half the length of the penultimate joint, acuminate, penultimate joint wider than the apical, the antepenultimate expanding at the tip, the last two with long brown hair-tufts on one side, especially the penultimate, a few long hairs on the apex of the antepenultimate, and a few long black bristles on the apex of the last two joints; proboscis deep brown, almost black; fore and mid ungues unequal, the larger uniserrated; hind ungues equal, small and simple; fork-cells of wings small; the first sub-marginal shorter and considerably narrower than the second posterior, its stem nearly equal to the length of the cell; stem of the second posterior equal to the length of the cell.

*Length*.—4 mm.

*Habitat*.—Bonny.

*Time of capture*.—May.

*Observations*.—Described from a series of ♀'s and a single ♂ collected by Dr. Annett, and in his collection. It is a clearly defined species, with banded abdomen and unbanded legs; the deep chestnut-brown thorax and grey and black head and unbanded legs separate it at a glance from all other African *Stegomyias* I have seen, except *S. Nigeria*, from which it differs in thoracic ornamentation, the two parallel pale lines on the mesothorax of *Nigeria* being absent.

## STEGOMYIA NIGRICEPHALA. Theobald.

(Rept. Liverpool School Trop. Med. p. iv. App. 1901.)

Head entirely black. Thorax dark brown, with bronzy-brown scales. Abdomen black, with small white basal lateral spots. Wings with dark brown scales and slightly tinged with brown. Legs dark brown, unbanded.

♀. Head black, entirely covered with flat black scales; clypeus, proboscis and palpi black; antennae dark brown, basal joint testaceous on one side, dark on the other. Eyes golden.

Thorax black, with rather long bronzy-brown curved scales forming rather a dense matting over the black surface, over the roots of the wings dense jet-black bristles; scutellum testaceous in the middle at the base, black at the apex, lateral lobes greyish-brown, mid lobe with flat black and grey scales and six (?)

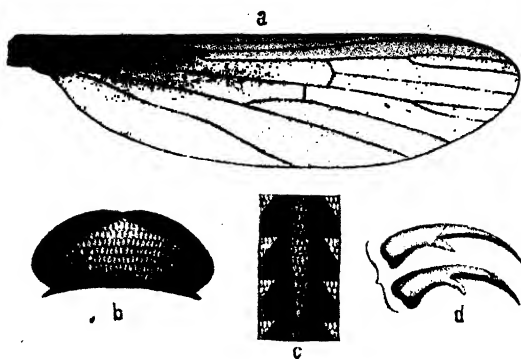


Fig. 301.

*Stegomyia nigricephala*. n. sp.

a, wing; b, head; c, abdominal ornamentation; d, unguis (fore) of ♀.

black border-bristles; metanotum blackish; pleurae very dark with three large patches of white scales.

Abdomen testaceous at the base, steely-black apically, covered with black scales, each segment with a small basal white lateral spot; venter black, with basal white bands.

Legs dark blackish-brown, coxae and trochanters pale brown; fore and mid unguis equal, uniserrated, hind equal and simple.

Wings slightly tinged with brown; veins clothed with dark brown scales; fork-cells small, the first sub-marginal a little longer but no narrower than the second posterior cell, its stem equal to about two-thirds of the length of the cell; stem of the second posterior as long as the cell; posterior cross-vein not quite twice its own length distant from the mid cross-vein.

Halteres with deep ochraceous stem and fuscous knob.

*Length*.—4·8 mm.

*Habitat*.—Bonny.

*Time of capture*.—May.

*Observations*.—Described from a single ♀ in Dr. Annett's collection. The specimen was taken in a native hut by Dr. Annett.

It can at once be told by the entire covering of black scales on the head and the rather long curved bronzy scales on the thorax and the unbanded abdomen.

#### STEGOMYIA PIPERSALATA. Giles.

(Handbook Mosq., 2nd edit. 1901.)

The following is Colonel Giles's description of this species:—

"Wings densely clothed with, for the most part, black scales; but on the costa, and along the bases of the long wings, are scattered snowy scales. Tarsal joints moderately broadly basally banded with snowy white; on all of the hind, the upper three of the mid, and the upper two of the joints of the fore leg. Thorax, black-grounded, clothed with narrow curved, mouse-coloured scales, with some whitish ones laterally which form indistinct curved markings. Abdomen sooty, with snowy lateral spots on the bases of the segments, which, in the ♀, especially on the anterior segments, may be connected to form narrow bands. Proboscis banded in the ♂, but not distinctly so in the ♀.

"Head, with black forked scales, and mouse-coloured long narrow ones. Antennae fuscous, those of the ♂ about equalling the proboscis in length. Palpi of ♀ black, with whitish tips; of the male, very little longer than the proboscis; first joint minute, second and third sub-equal, and together nearly as long as the proboscis, with an indistinct band on the articulation between them, placed a good deal inside the band on the proboscis, last two joints short and sub-equal, a band between them and the third, and all the end joint whitish. Proboscis black at the base, testaceous at the tip, with a broad band of white, well beyond the middle, in the ♂, but barely perceptible in the ♀. Legs, with a patch of white scales just above the tips of the femora in the ♂, but not in the ♀. The wings, legs and all other appendages are most curiously brindled with a mixture of snowy and black scales, the latter greatly preponderating, so that the insect looks peppered and salted. No other mosquito, at all likely to be mistaken for this species, has this mixture of white with black scales on the wings.

*Length*.—About 3 mm.

*Habitat*.—Jhansi and Gonda, N. W. Provinces, India."

NOTE.—Colonel Giles has presented the types of this species to the Museum. It is very distinct and can at once be told from any other Indian species by the mottled wings. It is distinct *Stegomyia*.

GENUS **ARMIGERES**. Theobald.

Colonel Giles, I believe, has two new *Armigeres*, but I have not been able to separate one from *A. ventralis*. His *A. panalectoros*, described below, is, however, I feel sure, distinct.

**ARMIGERES PANALECTOROS**. n. sp. Giles MS.

"Wings unspotted; tarsi nearly black, unbanded; thorax dark mouse-colour, adorned with lighter, lyre-shaped marks, much as in *Steg. fasciata*, Fabr. Abdominal segments sooty, dorsally unadorned, but with silvery ventral apical bands, exactly as in *C. ventralis*, Walker.

This is a much smaller gnat than *A. ventralis*, and differs also in having the thorax elaborately adorned, though the contrast of colour in the markings is not strong, and they are naturally distinguishable only in fresh specimens. The head and its appendages are black in both sexes, the ♂ antennae being as long as the distinctly spatulate proboscis, and the rather smooth, subulate palpi, fully a third longer. The wings closely resemble those of *A. ventralis* in venation, but the unscaled, inward extension of the third longitudinal is by no means so well marked. The ♂ unguis are markedly unequal, and provided with an accessory tooth on all the legs. The white ventral bands are broader externally, so that the black takes the form of semilunar spots.

*Habitat*.—This species was sent me by Major Alcock, Superintendent of the Indian Museum, during the rains, but I have not received it from any other part of India." (Giles.)

GENUS **CULEX**.

(Page 326, Vol. I.)

**CULEX (?) KOCHI**. Dönitz.

(Insecten Borse 5, p. 38, 1901.)

Head grey, with two dark patches; thorax bright chestnut-brown, with two more or less defined circles of pale scales. Abdomen deep brown, with apical white lateral spots and ochraceous scales on the apical portions of the segments and in the middle. Proboscis short, pale band in the middle. Legs with many pale bands; wings marked like *Anopheles*.

♀. Head mostly covered with flat scales, but with narrow curved ones in the middle and behind; two dark brown patches



of scales on the occiput, and a small black patch on each side, the spaces between creamy-grey, numerous small upright forked scales behind; proboscis very short, brown, with a broad creamy median band; palpi short, brown, grey at apex; antennae brown, basal joint paler.

Thorax bright chestnut-brown, covered with small narrow curved scales, the majority bronzy, but with two large more or less distinct rings of silvery grey ones which meet in the middle line, and with numerous broader silvery scales before the scutellum; scutellum brown, with small flat scales of a grey tint, with five median border-bristles; metanotum pale ochraceous-brown; pleurae brown, with flat grey scales in patches.

Abdomen brown, with brown-ochraceous and white scales, the white forming apical lateral spots, the ochraceous, median and apical lines, and forming most of the apical segments.

Legs brown, banded with creamy white on all the joints, the pale bands on the tarsi being apical, last tarsal joint unbanded.

Wings spotted like an *Anopheles*; scales short and rather broad like *C. atratus* all over the wing, base of the wing white; three large black patches along the costa, the apical one having a large and a small patch beneath it on the first long vein, the median one having one of similar size beneath it, the basal one also having one of similar size, between the median and basal is a small dark spot on the first long vein; veins mostly brown scaled with a few small spots of pale scales; fringe brown with pale scaled areas where the veins join the border; fork-cells rather short; first submarginal cell a little longer and narrower than the second posterior cell, its stem about half the length of the cell; posterior cross-vein a long way from the mid cross-vein, at least four times its own length distant.

Halteres with pale stem and fuscous knob.

Length.—4 mm.

Habitat.—New Guinea.

Observations.—Described from a somewhat damaged specimen sent me by Dr. Dönitz, who has described the ♀ from New Guinea. The ♂ is unknown. It is a most marked and beautiful species, and will probably have to be included in a new genus. The spotted wings look like some *Anopheles*, and the many banded legs like a *Panoplites*. Scales on the wings resemble *C. atratus*, and the head ornamentation is peculiar.

#### GENUS DUTTONI. Theobald.

(Rept. Liverpool School Trop. Med. p. v. App. 1901.)

Thorax dark brown, with golden-brown to golden narrow curved scales, with pale scaled areas in front, over the wings, two pale spots and pale scales in the middle of the back of the

mesonotum, continuous with those over the wings. Abdomen with basal creamy-white bands. Legs with banding involving both sides of the joints.

♀. Head dark brown, with narrow creamy curved scales around the eyes. On the back of the occiput and in the middle, those between of a more golden-brown hue; the fork scales in front (forming a band around the head) bright brown, those behind creamy, at the sides of the head are a few small white flat scales; the fork scales are very numerous, there is also a row of bright brown bristles projecting forwards over the eyes; clypeus black; palpi black scaled, with a few pure white ones up one side; proboscis deep blackish-brown, apex testaceous, and with a dull testaceous band on the apical half; antennae deep brown.

Thorax black, covered rather densely with narrow golden-brown curved scales, and pale rather broader creamy ones

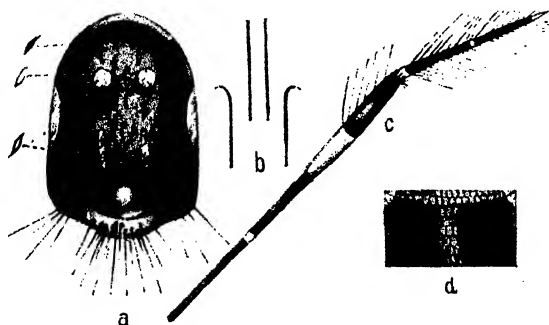


Fig. 302.

*Culex Duttoni*. n. sp.

a, Thorax; b, surface ornamentation of thorax; c, ♂ palp; d, abdominal segment.

arranged as follows:—Around the front of the mesothorax forming a narrow line, a more or less distinct spot on each side about the middle of the mesonotum, a long patch just over the roots of the wings, which bend round and pass up again on to the mesonotum; these latter are almost white; scutellum brown, with narrow curved pale golden scales, eight median golden-brown border-bristles, with some smaller fine pale golden ones over them; metanotum deep brown; pleurae dark brown, with a few small patches of white scales.

Abdomen deep brown, with basal dull creamy-white curved bands, and with more or less evident small lateral basal pure white spots; border-bristles rather long, lateral ones also long.

Legs with the coxae and trochanters ochraceous; femora deep brown, almost white beneath, apex white; tibiae brown,

with slightly paler base and apex and with pale hairs; metatarsi with the apex pale banded; fore tarsi with the first and second joints apically and basally pale banded, the third basally banded, the fourth only showing a trace of basal banding; mid tarsi the same as the fore; hind tarsi also very similar; unguis small, equal and simple; hind metatarsi longer than the hind tibiae.

Wings with typical brown *Culex* scales; fork-cells rather long; first sub-marginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing, its stem rather less than one-third the length of the cell; second posterior cell with its branches slightly contracted where they join the wing, its stem rather less than one-half the length of the cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein. Halteres pale ochraceous.

*Length*.—4.8 to 5 mm.

♂. Palpi dark brown, with five white broken bands, last two joints with black hairs, apex of the antepenultimate also slightly hairy, apical joint acuminate; proboscis deep brown, with an indistinct pale band; antennae dark brown, with deep brown plumes, faintly banded with paler brown; basal joint deep ferruginous.

Abdomen narrow, the basal creamy-yellow bands prominent, the last segment with creamy-white scales in the middle; abdomen hairy.

Legs banded much as in the ♀, but the last two tarsi seem to be unbanded; fore unguis unequal, both uniserrated, mid unguis unequal and uniserrated; hind equal and simple, small.

Wings with the fork-cells very small, first sub-marginal very little longer but much narrower than the second posterior, its base nearer the apex of the wing than that of the second posterior cell, its stem slightly longer than the cell; posterior cross-vein about its own length distant from the mid cross-vein.

*Length*.—5 mm.

*Habitat*.—Duketown.

*Time of capture*.—April.

*Observations*.—Described from a series bred by Drs. Annett and Dutton from larvae obtained at Conoes Creek, Duketown. The thoracic ornamentation soon loses its characteristic appearance by denudation, the golden scales only remaining; the tarsal banding involving both sides of some of the joints and the faintly banded proboscis should readily separate it from other African species. (C. No. II. label sign).

The banding on the abdomen in the male spreads out laterally on the sixth and seventh segments.

The two, sometimes three, white bands on the antepenultimate joint of the male palpus are very characteristic, the most apical band being very wide.

## CULEX SECUTOR. n. sp.

Head deep brown, with creamy grey scales in the middle, darker round the edge, and upright forked scales projecting out laterally; thorax deep brown, covered with pale golden-brown scales, with two prominent bare lines in the middle in front, slight expanding anteriorly. Abdomen almost black, with traces of white basal banding. Legs deep brown, the anterior and middle unbanded, the posterior with apical and basal banding.

♀. Head deep brown, with narrow curved dull golden-brown scales in the middle, and with deep brown upright forked scales projecting outwards around the paler scaled area; proboscis and clypeus black; palpi covered with deep brown scales, with a small dull basal grey band to the long apical joint and a few grey scales scattered about; antennae deep brown, with narrow grey bands.

Thorax deep brown almost black, covered with small narrow curved golden-brown scales, in front of the mesonotum are two



Fig. 303.

*Culex secutor*. n. sp.

a, Head; b, thorax.

parallel bare lines which expand a little in front; there is a median double row of black bristles and also lateral rows; scutellum deep brown in the middle, testaceous at the sides, with narrow curved pale golden-brown scales and six nearly black median bristles; metanotum deep blackish-brown; pleurae brown, with a few small patches of grey scales.

Abdomen black, with black scales showing violet reflections, the third and fourth segments showing narrow dull white basal bands, the others with traces of dull white basal spots, moderately hairy.

Legs deep brown, fore and mid unbanded, hind banded, the bands involving both sides of the joints; in the fore and mid legs there is a whitish knee spot and at the apices of the tibiae are a few white scales and testaceous hairs; unguis of the fore and mid legs equal, simple, curved; in the hind legs the metatarsi and all the tarsal joints are apically and basally pale banded; unguis small, equal, and simple.

Wings covered along the veins with deep brown typical *Culex* scales; fork-cells rather short, the first sub-marginal a little longer, but no narrower than the second posterior cell; its stem equal to rather more than one-third of the length of the cell, its base a little nearer the base of the wing than that of the latter; stem of the second cell about two-thirds the length of the cell; posterior cross-vein nearly three times its own length distant from the mid cross-vein. Halteres with a fuscous and grey stem and pale ochraceous knob.

*Length*.—4 mm.

♂. Palpi deep brown, the penultimate joint with a small spot at the base of a pure snowy white, the two apical joints are about equal, rather long and with black hair-tufts, the long antepenultimate joint has a narrow pale ring basally and is hairy at the apex, ground colour ochraceous, which when the palpi are denuded in parts give them a pale banded appearance; antennae banded dark brown and grey, plume-hairs deep brown; proboscis deep brown, with a narrow pale band on the apical half.

Thorax as in the ♀; abdomen with the second segment mostly grey scaled and the other segments more distinctly banded and with more distinct lateral spots, densely hairy with golden-brown hairs.

Fore and mid legs with small apical banding, hind with the banding as in the ♀, the last tarsal joint rather pale; fore and mid unguis unequal, the larger one uniserrated, the hind equal and simple.

*Length*.—4 to 4.5 mm.

*Habitat*.—Jamaica (Grabham) (111).

*Observations*.—Described from two ♀'s and two ♂'s sent by Dr. Grabham. The specimens were bred from larvae sent by Mr. Harris from Cinchona, 4900 feet. "I have also caught it," says Dr. Grabham, "in Kingston, where it is especially abundant after the heavy autumnal rains, also an energetic bloodsucker. The insects follow one about in a regular cloud."

Dr. Grabham also sends the larvae and pupae.

It is a very distinct species which can at once be told by the thoracic ornamentation and the peculiar banding on the legs.

#### CULEX NIGRIPALPUS. n. sp.

Head grey; thorax chestnut-brown; abdomen almost black, unbanded, grey ventrally; proboscis almost black; palpi longer than proboscis, black, last two joints with black hairs, acuminate; legs dark brown, unbanded.

♂. Head dark brown, the middle clothed with very small narrow golden curved scales, the sides with flat greyish scales,

which extend some way each side on to the occiput ; there are also numerous small black upright forked scales on the back of the mid area down to the nape ; antennae brown, with grey bands and dark brown to almost black plumes ; proboscis black, testaceous at the apex ; palpi longer than the proboscis by nearly the whole of the last two joints, there are traces of a pale band near the base of the antepenultimate joint, the penultimate joint a little longer than the apical joint, minutely testaceous at the base, apical joint acuminate ; the last two joints with stiff black hairs, and the apex of the antepenultimate with two thick bristles.

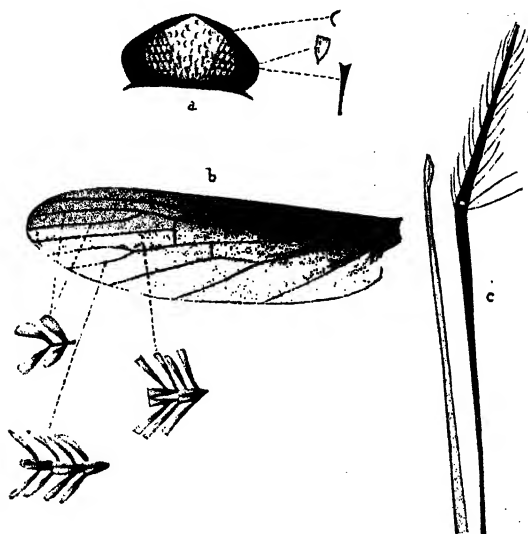


Fig. 304.

*Culex nigripalpus*. n. sp.

a, Head ; b, wing of ♀ and enlarged scales ; c, ♂ palpus.

Thorax deep clear chestnut brown, with very small narrow curved dull fawn-coloured scales and with black bristles, especially long over the roots of the wings ; scutellum pale ochraceous to greyish-brown with small curved pale dull brown scales and long brown border-bristles, six in number to the mid lobe ; metanotum brown ; pleurae pale brown.

Abdomen covered with deep brown scales dorsally, with violet reflections, venter pale, covered with grey scales ; on the last segment are some grey scales also dorsal ; genitalia ochraceous ; border-bristles rather pale.

Legs dark brown, the femora greyish beneath ; fore ungues unequal, rather straight, the larger one uniserrated, the smaller

(apparently) simple; mid unguis unequal, very similar to the fore; hind ones minute, equal, and simple.

Wings with brown scales, the median ones rather thick and short and dense, especially on the fork-cells, but also with longish, nearly straight lateral scales, the scales on the sub-costal and first long vein darker and very dense, those forming the upper border of the wing black and lanceolate; the first sub-marginal cell a little longer and narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem equal to about one-fourth of the length of the cell, considerably shorter than that of the second posterior cell, which is equal to about two-thirds of the length of the cell; posterior cross-vein more than twice its own length distant from the mid cross-vein; fringe dark brown.

*Length*.—2.5 mm.

*Habitat*.—St. Lucia (Dr. Low).

*Observations*.—Described from a single ♂ in perfect condition. It can at once be told by the dark pointed palpi and unbanded abdomen from any other of the related species. The head ornamentation is very peculiar and marked. The lateral flat grey scales show very clearly against the brown thorax. No note of any kind sent with the specimen.

#### CULEX ANGULATUS. n. sp.

Thorax deep brown, with narrow curved dull golden-brown scales; pleurae pale. Abdomen dark brown, with yellow basal bands with a triangular expansion in the middle of each. Legs brown, long and thin, unbanded.

♀. Head brown, with grey curved scales and almost pearly white flat ones at the sides, numerous ochraceous and brown upright forked scales on the occiput, a few median golden-brown bristles projecting between the eyes; eyes black and silvery; palpi long, deep brownish-black, hairy; antennae dark brown, basal joint and base of the second joint bright testaceous; clypeus chestnut-brown; proboscis brown.

Thorax dark brown, with traces of two narrow parallel black lines on the denuded surface, covered with very small curved hairlike rich brown to dull golden-brown scales and with dark brown bristles, the scales in front of the scutellum seem to be rather paler; scutellum greyish-ochraceous, with very small narrow curved pale scales and six border-bristles to the mid lobe; metanotum deep brown, testaceous on each side at the base; pleurae pale ochraceous, with an occasional dark patch.

Abdomen deep brownish-black, with basal pale bands, yellowish-white to white when viewed facing the light, deep ochraceous yellow when held away from the light; the basal bands

have a more or less regular angular enlargement in the middle in each segment; venter pale ochraceous.

Wings with the veins covered with typical brown *Culex* scales, dark along the upper border; the first sub-marginal cell very little longer and about the same width as the second posterior cell, its base nearer the apex of the wing than the base



Fig. 305.

*Culex angulatus*. n. sp.

Wing of ♀ and abdominal ornamentation.

of the second posterior; the first sub-marginal cell two and a half times as long as its stem, which is longer than the stem of the second posterior cell; both fork-cells long; posterior cross-vein much longer than the mid cross-vein, about its own length distant from it; halteres with a pale ochraceous stem and fuscous knob.

Legs brown, unbanded, long and thin, pale at the base; unguis equal and simple.

*Length*.—4 to 4.5 mm.

*Habitat*.—Naini Tal (4000 feet), Giles.

*Time of capture*.—June.

*Observations*.—Described from two ♀'s in Lieut.-Colonel Giles's collection, who pointed out on the label the peculiar banding of the abdomen. They are clearly distinct, but come near *C. fatigans*, from which they can be told by the venation, relatively longer legs, smaller thoracic scales and abdominal ornamentation.

#### CULEX TIPULIFORMIS. n. sp.

Thorax brown, with narrow golden-brown curved scales, paler behind; pleurae with white scales. Abdomen dark brown with basal white median semicircular patches on segments two to five, basal bands spreading out laterally on the apical



segments; legs unbanded, paler brown, with white scales, very long and thin.

♀. Head dark brown, with narrow curved grey scales on the occiput, flat grey ones at the sides, and numerous ochraceous and brown upright forked ones, the former in front of the head; clypeus chestnut-brown; proboscis brown, mottled with creamy grey scales, thin; palpi deep brownish-black, with pearly white scales on the ventral (?) surface; antennae brown, basal joint partly brown, partly bright testaceous, base of the second joint bright testaceous.

Thorax brown, with two thin dark parallel lines, covered with narrow curved golden-brown scales, which become paler on

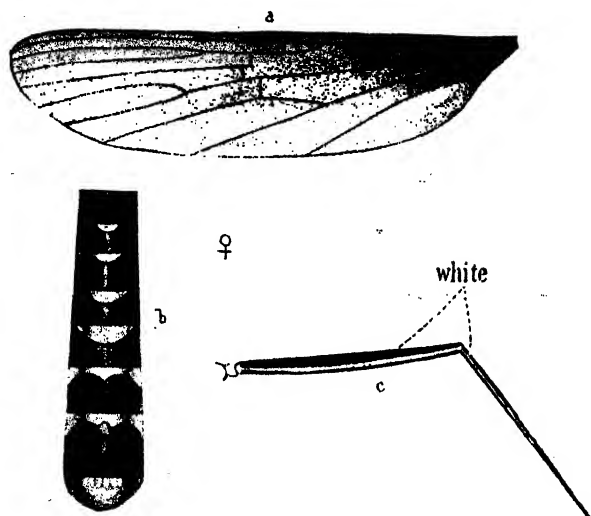


Fig. 306.

*C. tipuliformis*. n. sp.

a, Wing of ♀; b, abdominal ornamentation; c, leg.

the back portion of the mesonotum and over the roots of the wings, numerous black and brown bristles over the roots of the wings and at the sides; prothoracic lobes chestnut-brown, with a tuft of narrow curved grey scales; scutellum testaceous at the base, greyish apically, with golden-brown border-bristles, apparently six to the mid lobe; metanotum chestnut-brown; pleurae pale brown and ochraceous, with patches of flat white scales.

Abdomen rather long and narrow, chestnut and steely-brown when denuded, hairy; first segment with a small median patch of black and grey scales, the grey ones being central; the other segments covered with deep brownish-black scales and with the following pale basal markings; segments two to five,

with a large semicircular basal dull creamy patch, six and seven with dull basal and creamy white bands which spread out laterally to form large lateral spots, the apex of the abdomen mostly white scaled; venter ochraceous. Wings rather long, with typical brown *Culex* scales; the first sub-marginal longer and narrower than the second posterior cell, its base nearer the base of the wing, its stem about one-fourth the length of the cell, considerably shorter than the stem of the second posterior cell, which is more than one-third the length of the cell; super-numerary and mid cross-veins not united, the mid a little nearer the apex of the wing; posterior cross-vein *nearly twice as long as the mid* and not quite its own length distant from it; halteres with an ochraceous-brown stem and slightly fuscous knob.

Legs long and thin, brown, testaceous at the base, femora and tibiae with a distinct line of pure white scales running down their whole length; femora with distinct bristles, black and golden-brown; unguis black, equal and simple; the legs show distinct ochraceous and bronzy reflections under the lens.

*Length*.—5.8 mm. (of hind legs 7 mm.).

*Time of capture*.—March.

*Habitat*.—Bakloh (N.W. Provinces, India).

*Observations*.—Described from a single ♀, sent to Lieut.-Col. Giles by Capt. Lindsey. It is a very distinct large species, with peculiar leg markings and abdominal ornamentation; the proboscis has a bi-annulated appearance and the legs are long and thin, giving it the appearance of a small Tipulid.

#### CULEX RIMA. Theobald.

(Rept. Liverpool School Trop. Med. p. xi. App. 1901.)

Thorax deep brown; abdomen deep brown, with metallic bronzy and violet reflections; with four white apical lateral spots and grey venter. Legs deep brown, unbanded. Wings with rather broad scales, like *C. atratus*, Theobald. Ungues small, curved, equal and simple.

♀. Head dark brown, with narrow curved dull grey scales and numerous short upright black ones; clypeus black, *with a transverse sulcus*; antennae brown, with reddish-brown basal joint; proboscis black, testaceous at the apex; palpi rather thick black. Thorax deep brown, with very minute narrow curved dull brown scales and long black backwardly projecting bristles; scutellum deep chestnut-brown in the middle, greyish apically, with narrow dull brown curved scales and black border-bristles; metanotum deep brown; pleurae greyish or greyish-brown.

Abdomen bronzy black, with deep bronzy green and deep violet reflections when held in different lights, the four posterior segments with *four distinct white apical spots*; posterior border-

bristles dull brown, short, apex pubescent. Legs deep brown; the coxae very pallid and also the venter of the femora; the metatarsi and tarsi with somewhat dull ochraceous reflections ventrally. Ungues small, equal, and simple.

Wings densely scaled towards their apices with rather short, thick, brown scales (as in *C. atratus*, mihi); fork-cells rather short, first submarginal cell longer and narrower than the second posterior cell, base of the latter if anything a little the nearer the base of the wing; stem of the first sub-marginal equal to about half the length of the cell; stem of the second posterior as long as the cell; posterior cross-vein slightly curved in the

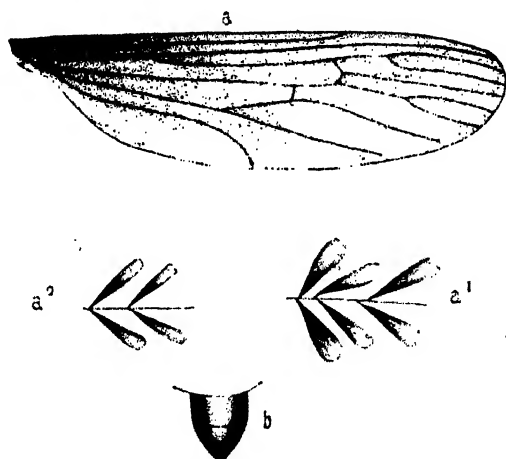


Fig. 307.

*Culex rima*. n. sp.

a, Wing of ♀ and a¹ and a², wing scales; b, clypeus.

middle, nearly three times its own length distant from the mid cross-vein; fringe brown, very dark at the apex of the wing.

Halteres with ochraceous stem and fuscous knob.

Length.—2·8 mm.

Habitat.—Old Calabar.

Time of capture.—April.

Observations.—Described from three ♀'s. A small species with very distinct abdominal ornamentation. In two the thorax is paler brown. It is closely related to the little black *Culex* I call *Culex atratus*, common in Jamaica. The peculiar wing scales and general facies of these two species will necessitate their removal from *Culex*, but I am waiting for more material, as I have only received one ♂ (*C. atratus*) of this group.

## CULEX INVIDIOSUS. Theobald.

(Rept. Liverpool School Trop. Med. p. xi. App. 1901.)

Head deep brown, with greyish sheen, seen in some lights; thorax deep chestnut-brown; abdomen blackish-brown, unbanded and unspotted; pleurae paler brown; legs deep brown, coxae and bases of femora pale.

♀. Head deep brown, almost black, covered with dull ochraceous grey narrow curved scales over the occiput, black upright forked ones and small flat dull white lateral ones, a narrow rather indistinct grey border round the eyes, clypeus deep chestnut-brown; proboscis deep blackish-brown: palpi short, densely black scaled; antennae brown, basal joint testaceous in the centre.

Thorax brown, with narrow curved dull golden-brown scales and black bristles; scutellum rather shiny rich brown, with narrow curved dull grey and brown scales, six bristles to the mid

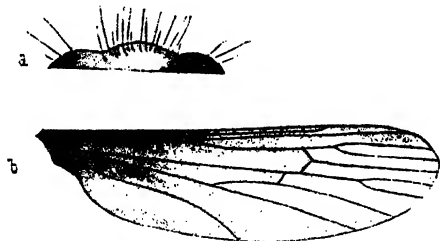


Fig. 308.

*Culex invidiosus*. n. sp.

a, Scutellum; b, wing of ♀.

lobe and four each to the lateral lobes; metanotum deep brown; pleurae pale ochraceous brown.

Abdomen deep brown, with slight deep violet reflections; narrow; border-bristles short and pale, apex testaceous, rather hairy; venter brown, hairy, testaceous at the base; the scales at the sides in some lights under the microscope have a dull violet grey hue.

Legs deep brown, with deep violet reflections, coxae pale ochraceous, with a number of pale hairs; venter of femora pale ochraceous, tibiae and bases of the metatarsi with a few bristles; ungues small, equal and simple.

Wings with typical brown *Culex* scales, first sub-marginal cell longer and a little narrower than the second posterior cell, its stem is about one-third the length of the cell, its base nearer the base of the wing than that of the second posterior, stem of the latter more than one-half the length of the cell; mid cross-

vein long; posterior cross-vein not quite twice its own length distant from the mid.

Halteres with ochraceous stem and fuscous knob.

Length.—3.2 mm.

Habitat.—Bonny.

Time of capture.—May.

Observations.—Described from a single ♀. I do not know any species at all resembling it, yet there are no very distinctive characters. The unbanded legs and abdomen and its general brown colour when roughly examined make it resemble *Aedes nigra*, but it can at once be told from it by the head and wing scales, which are of typical *Culex* form.

Another ♀ differs considerably in colour, but I can detect no structural difference. It is much paler, of a general ochraceous tint, due to denudation of the scales. The thorax is paler brown, with two pale median parallel stripes in front, separated by a darker line, and the scutellum has seven mid bristles, and the venter of the abdomen is paler and grey scaled. Venation, scales, unguis, etc., are similar, and it was taken in the same place and date as the type. I fancy one is full of ova, the other dark with blood.

#### 14. CULEX INVENUSTUS. Theobald.

(Rept. Liverpool School Trop. Med. p. ix. App. 1901.)

Thorax dark brown; abdomen black, unbanded and unspotted. Legs dark brown, with pale grey bases, fore and mid femora thick.

♀. Head almost black, with narrow ochraceous grey curved scales, blackish and brown thin upright forked ones, white flat

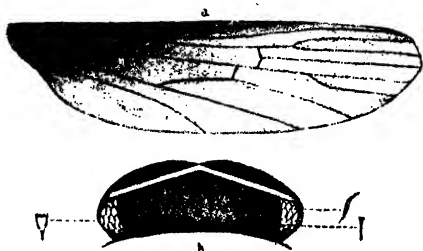


Fig. 300.

*Culex invenustus*. n. sp.

a, Wing of ♀; b, head.

scales at the sides and a narrow white border round the eyes; eyes black; palpi short, dark brown; proboscis rather short, dark brown, testaceous at the tip; antennae dark brown, basal joint black, last two joints very hairy; clypeus black. Thorax

dark steely black, covered with small dull bronzy-brown flat scales, forming a complete layer; when denuded the thorax shows three narrow parallel black lines; scutellum greyish-brown, with narrow curved pale scales and black border-bristles; metanotum dark brown; pleurae ochraceous brown, slightly darker in front.

Abdomen deep blackish-brown, narrow, unbanded and unspotted; posterior border-bristles dull-brown; venter rather pale.

Legs unbanded, deep brown, coxae pale, fore and mid femora swollen, hind femora narrower, pale beneath; tibiae and metatarsi rather bristly; unguis small, much curved, equal and simple. Wings with brown scaled veins of typical *Culex* form; fork-cells moderately long, the first sub-marginal considerably longer but no narrower than the second posterior cell, its stem about one-fourth the length of the cell, its base nearer the base of the wing than that of the second posterior cell; stem of the latter half the length of the cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein.

Length.—3.5 mm.

Time of capture.—June.

Habitat.—Degama, W. Africa.

Observations.—Described from a single perfect ♀. It can at once be distinguished by the general brown colour, unbanded and unspotted abdomen, and by the swollen fore and mid femora. It comes very near my *Culex longipes* in appearance.

The much swollen femora are probably of generic value, but I have only seen two specimens, both ♀'s, showing this character, and hence place them provisionally in *Culex*. *C. longipes*, mihi, comes from the Malay Peninsular.

## 15. CULEX NEBULOSUS. Theobald.

(Rept. Liverpool School Trop. Med. p. x. App. 1901.)

Head dark brown, with a pale border round the eyes. Thorax brown, with tawny-brown scales. Abdomen dark brown, with traces of dull grey apical lateral spots. Legs unbanded.

♀. Head dark brown, with narrow curved, dull golden-brown scales, numerous brown upright forked ones and a distinct white border round the eyes, and white scales at the sides; clypeus, proboscis, palpi and antennae brown, basal joint of the latter testaceous at the base; eyes black and golden.

Thorax shiny black, covered densely with very narrow curved tawny-brown scales, and showing two darker parallel lines on the denuded surface, numerous golden-brown and dark brown bristles over the roots of the wings; scutellum brown, with very narrow almost hair-like pale scales, six bristles to the mid lobe; meta-

notum dark chestnut-brown; pleurae brown and ochraceous, with scanty flat white scales.

Abdomen deep brown, unbanded, with dull violet reflections, indistinct apical creamy-white lateral spots; venter grey and brown.

Legs brown, unbanded; coxae and trochanters ochraceous, the former with dull white scales; femora dull pale ochraceous beneath.

Wings with brown scales of typical *Culex* form; first submarginal cell considerably longer and a little narrower than the second posterior cell, its stem about one-third the length of the

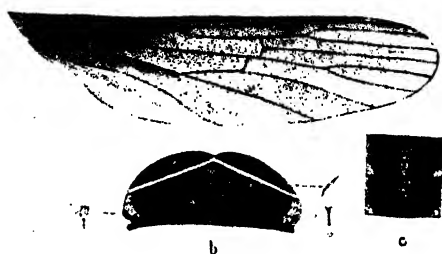


Fig. 310.

*Culex nebulosus*. n. sp. (♀.)

a, Wing of ♀; b, head; c, abdominal ornamentation.

cell; stem of the second posterior equal to rather more than half the length of the cell; posterior cross-vein considerably longer than the mid cross-vein, not quite its own length distant from it.

Halteres with slightly fuscous knob and ochraceous stem.

*Length*.—3 to 3.5 mm.

*Time of capture*.—April, August, September.

*Habitat*.—Old Calabar, Chumbele (Annett).

*Observations*.—Described from six specimens. A rather obscure species, with traces (more or less distinct) of pale apical lateral abdominal spots and rather marked cephalic ornamentation.

### 13. *CULEX PRUINOSUS*. Theobald.

*C. pruina*. Theobald.

(Rept. Liverpool School Trop. Med. p. viii. App. 1901 = *C. pruina*.)

Thorax covered with frosty-grey scales, with traces of two parallel darker lines. Abdomen with the last three segments with basal lateral white spots almost forming bands, bases of the other segments slightly paler, in the ♂ with more or less distinct banding. Legs brown, unbanded.

♀. Head brown, clothed with hoary, narrow curved scales and numerous ochraceous upright forked ones; eyes black; clypeus, palpi and proboscis deep brown; antennae brown, basal joint paler.

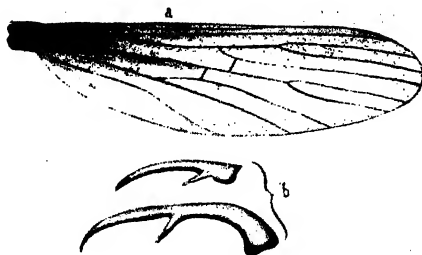


Fig. 311.

*Culex pruinosus.*

a, Wing of ♀; b, fore unguis of ♂.

Thorax shiny black, covered with thin hair-like curved hoary scales and showing traces of two dark parallel bands on the denuded surface; scutellum with narrow curved hoary scales; metanotum testaceous and ochraceous; pleurae dark brown above, ochraceous below.

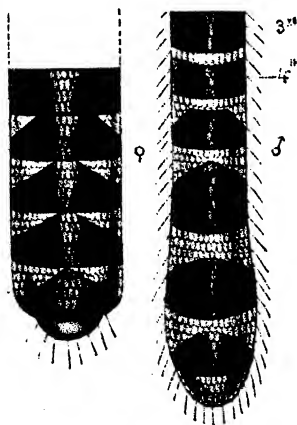


Fig. 312.

*Culex pruinosus.*

Male and female abdominal ornamentation.

Abdomen dark brown, almost black, the fifth to eighth segments with basal white lateral patches which are most pronounced on the sixth, seventh and eighth segments; the abdomen shows violet reflections; border-bristles pale.



Legs brown, unbanded, ventral surface of the femora nearly white; unguis equal and simple.

Wings with pale brown typical *Culex* scales; fork-cells rather long and narrow, the first sub-marginal longer, but no narrower than the second posterior cell, its base nearer the base of the wing than that of the latter, its stem less than one-third the length of the cell; stem of the second posterior cell less than one-half the length of the cell; supernumerary cross-vein long and sloping, forming a very acute angle with the mid cross-vein; posterior cross-vein longer than the mid, about one and a-half times its own length distant from it.

Halteres ochraceous.

Length.—5 to 5.2 mm.

♂. Palpi ochraceous, covered with dark brown scales, a small pale band near the base, the last two joints with dense black hairs, and also on one side of the apex of the antepenultimate joint; antennae banded, brown and grey, with deep flaxen-brown plumes; proboscis deep-brown, apex testaceous. Abdomen narrow, expanding apically, the fourth and fifth segments with basal white bands, the apical ones as in the ♀; moderately hairy. Fore and mid unguis unequal, the larger one uniserrated, the smaller with a tooth near the base, hind equal and simple.

Length.—5 to 5.3 mm.

Time of capture.—August.

Habitat.—West Africa (Annett).

Observations.—Described from five specimens in Dr. Annett's collection. A very distinct species, with hoary scaled thorax, which has a dull golden tinge, however, in some lights; the banding of the abdomen and the form of the cross-veins are also characteristic.

The original spelling of the specific name is wrong; it should not be *pruina*, but *pruinosa*.

#### 10. CULEX DECENS. Theobald.

(Rept. Liverpool School Trop. Med. p. vii. App. 1901.)

Thorax deep brown to black, with chestnut-brown scales. Abdomen almost black, with basal regular white bands on the third to fifth segments, which widen out prominently on the sixth and seventh to form clear lateral spots. Legs dark brown, unbanded.

♀. Head almost black, with small narrow curved creamy scales and numerous dark upright forked scales, quite black in some lights, the pale scales form a distinct line round the eyes; clypeus dark brown; palpi deep black; antennae dark brown, with black verticillate hairs and pale pubescence; proboscis deep bronzy-brown.

Thorax black, deep brown in some lights, with very narrow

curved, bright chestnut-brown scales, rather paler in front, two dark median parallel lines show on the denuded surface, bristles deep brown, especially long and thick over the roots of the wings; scutellum brown, with very small narrow curved pale scales, seven bright brown chaetae to the mid lobe; metanotum brown; pleurae ochraceous and slaty-grey, with two patches of white scales and an elongated patch just over the first two pairs of legs.

Abdomen covered with deep blackish-brown scales, the first segment dull ochraceous with two median patches of dull black scales and long pale hairs, the second to fifth segments with basal white bands, on the fifth the band spreads out a little laterally, on the sixth and seventh the band is rather broken in the middle but much expanded laterally, the eighth segment is mainly white; border-bristles longest at the sides.

Legs brown, unbanded, coxae to base of femora pale, venter of femora grey, remainder deep brown, femora, tibiae and metatarsi, especially of hind legs, spiny; unguis small, equal, curved, simple.

Wings with the veins with typical brown *Culex* scales; first long vein rather bent about half way along the wing; first submarginal cell longer and just slightly narrower than the second posterior cell, its base nearer the base of the wing, its stem equal to about one-third of its length; stem of the second posterior cell equal to about half the length of the cell; posterior cross-vein nearly twice its own length distant from the mid cross-vein; halteres with ochraceous stem and fuscous knob.

*Length*.—5 mm.

♂. Palpi all deep brown to dull black, just a trace of a narrow pale band near the base, the apical joint a little longer than the penultimate joint, acuminate, the two last joints with numerous blackish hairs, short and dense on the under surface



Fig. 313.

*Culex decens*. n. sp.

Male palp.

only, a few also at the apex of the antepenultimate joint, the remainder with short pale hairs all on the ventral surface, densely scaled below; the palpi are longer than the proboscis by the last joint and the apical third of the penultimate joint;

proboscis dark brown, apex testaceous; antennae grey, with deep brown bands and brown plume-hairs.

Thorax as in the ♀; abdomen narrow, ornamented as in the ♀. Legs unbanded, traces of a pale knee spot; fore and mid unguis unequal, the larger one uniserrated, the smaller (?); hind unguis small, equal.

*Length*.—4.5 mm.

*Habitat*.—Bonny (Annett).

*Time of capture*.—May.

*Observations*.—Described from a single ♂ and ♀ taken by Dr. Annett and in his collection.

The abdominal banding of the seventh and eighth segments expanding laterally serves as a good means of identifying it at a glance.

#### 11. *CULEX HUMILIS*. n. sp. (Lutz MS.).

Thorax brown; abdomen covered with deep blackish-brown scales, with narrow basal white bands. Legs unbanded. Apical terminations of the veins with dense thick scales, like *C. atratus*, *mihi*.

♀. Head with flat grey scales at the sides and around the front, narrow dull golden curved ones on the occiput and dusky upright forked ones, a more or less distinct pale border round the eyes, palpi rather long, brown, grey beneath; proboscis deep brown, expanded apically; antennae brown, basal joint pale.

Thorax brown, with narrow curved dull golden-brown scales (denuded); pleurae deep fawn-colour; scutellum brown, with narrow golden-curved scales; metanotum deep brown.

Abdomen deep brown, with narrow rather indistinct basal grey bands and traces of white lateral spots.

Legs deep-brown, unbanded, venter of femora pale, femora rather swollen, especially the fore pair, a row of pale golden bristles on the fore tibiae; unguis small, equal, and simple.

Wings much as in *C. atratus*, the apical portions of the veins being similarly densely scaled.

*Length*.—3.5 mm.

♂. Palpi longer than the brown proboscis; palpi brown, last two joints nearly equal, hairy, apex of antepenultimate rather swollen.

Abdomen densely hairy, deep brown, with basal white bands, which expand laterally. Unguis of fore and mid legs unequal, both uniserrated; of hind small, equal, and simple.

*Length*.—3.2 mm.

*Habitat*.—Sao Paulo, Brazil (Lutz).

*Observations*.—A small brown species, closely related to *C. atratus* and evidently forming with it and a few others a distinct genus.

Dr. Lutz proposed the name *humilis* in a letter to me, hence I have adopted his name.

Dr. Lutz says the thorax is somewhat green underneath and at the base of the legs. It is not very common, and is limited to swampy regions; biting probably only at night. Dr. Lutz in a later letter tells me he has bred the species several times from larvae taken in swampy places. Fresh specimens are often decidedly green.

*CULEX ALBOPUNCTATUS.* Rondani.

(Boll. della Soc. Ent. Ital. iv. Rondani (1872); Venti Specie Zanz. Ital. p. 135, Ficalbi (1899).)

Description from Ficalbi:—Palpi della femmina aventi un piccolo, ma evidente articolo ( $4^{\circ}$ ) posto sulla estremità dell' articolo

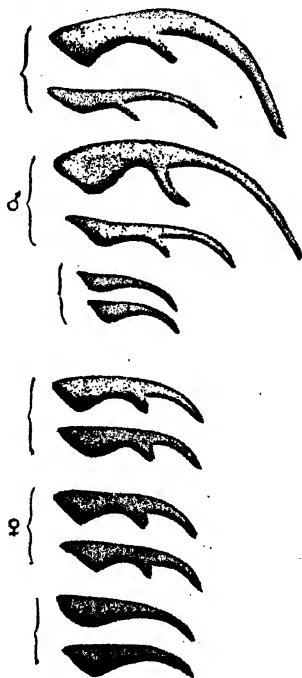


Fig. 314.

*Culex albopunctatus.* Rond.  
♂ and ♀ unguis (after Ficalbi).

lungo ( $3^{\circ}$ ). Notazione denticolo-ungueale della femina 1.1—1.1—0.0, del maschio 1.1—1.1—0.0.

Tarsi di ambo i sessi nè albo-annulati, nè albonotati, ma uni-

colori, brunoneri o neri. Dorso del torace avente parte di mezzo nera lineata da sottile stria mediana anteroposteriore di color bianco-avorio, posteriormente dividendesi, e parti laterali come due belle fascie di color giallo-paglerino aurato. Ali non

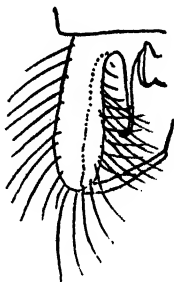


Fig. 315.

Male genitalia of *C. albopunctatus* (after Ficalbi).

macchiate. Dorso dell' addome di color brunonero o nero, e ogni tergite, eccetto l'ultimo, presentante ad ambo i lati una macchia triangolare bianca.

*Dimensioni*—del maschio 6 a 8 mill., della femmina 7 a 9 e anche 10.

#### *Note dietologiche.*

Ho trovato questa zanzare in vari boschi del nostro paese; in Toscana la ho trovata nel bosco di Pian d'Alma presso Castiglione della Pescaia, nei boschi di Gavorrano, nel bosco di Tombolo in quel di Pisa, e nel bosco del giardino di Boboli in Firenze; la immagine, per ciò, ossia per le sue abitudini, è da dirsi silvicola. Ma per l'*habitat* della larve questa zanzare è da dirsi subpalustre; l'avrei detta addirittura palustre se non l'avessi trovata in Firenze, ove le larve certamente devono essersi sviluppate nelle vasche del giardino e del bosco di Boboli. E specie a femmine avida di sangue, che nei boschi ombrosi assalgono in pieno giorno. I maschi sono innocui e fitofagi: mi era difficile trovarne, quando (nel bosco di Pian d'Alma) ne vidi uno sopra un fiore; osservatolo attentamente, notai che era intento a succhiare; esaminando poi nel bosco simili fiori, potei facilmente ottenere vari altri maschi.

*Osservazioni.*—Tra le specie della letteratura se ne trovano tre, le quali hanno il carattere di possedere macchie laterali bianche nei segmenti del resto bruni o neri dell'addome, e sono il *Culex lateralis* di Meigen, 1818, il *C. stricticus* pure di Meigen, 1838, e il *C. albopunctatus* di Rondani, 1872.

In confronto della zanzara da me qui descritta, la seconda, o

il *C. stricticus*, che Meigen dice somigliare al *C. ornatus*, avere dorso del torace grigiobruno con lati color di ruggine, avere le macchie addominali così fatte che nei primi tergiti sono a guisa di bande, mi è sembrata senz' altro da eliminare.

Restano le altre due, *C. lateralis*, Meigen, e *C. albopunctatus*, Rondani. Non nascondo che sono stato molto indeciso se la mia zanzara (posto che ho escluso il caso di farne una specie nuova) dovessi indentificare con la specie di Meigen o invece con la specie di Rondani; poichè la seconda di queste due specie, o il *C. albopunctatus*, è della prima così insufficientemente differenziata, che nel 1896 potei scrivere: "E specie mal definita, e dimando se non sia forse il *C. lateralis* di Meigen." Tuttavia visto che i caratteri della mia zanzara e la descrizione di Meigen qualche piccola difformità presenterebbero (Meigen dice il torace avere il dorso bianco-bigio con due linee nere ravvicinate, ed avere i lati nerici, e per l'addome Meigen parla di punti piuttosto che di macchie) mi sono deciso a identificarla col *Culex albopunctatus* (di Rondani), con la breve caratterizzazione del quale concorda e col quale ha comune la patria.

## GENUS URANOTAENIA. Arribalzaga.

(Page 241, Vol. II.)

### URANOTAENIA LOWII. n. sp.

Head with two silvery-blue patches; thorax bright chestnut-brown, with two dark parallel median lines, a dark brown patch on each side over the roots of the wings, a shiny silvery spot at the root of each wing; metanotum dark brown in the middle, pale chestnut-brown at the sides. Abdomen dark brown, with traces of apical pearly-blue lateral spots. Legs brown, the last two and the apical half of the antepenultimate hind tarsi white. Wings with a patch of violet and mauve scales at base of the fifth long vein.

♀. Head dark brown, with deep brown flat scales over the occiput, a small patch of silvery-blue ones on each side; eyes black; antennae deep brown, basal joint dark brown, second joint pale, rather swollen, verticillate hairs long and dark, joints all hairy; proboscis brown, much swollen apically and hairy towards the tip, densely brown-scaled.

Thorax bright clear chestnut-brown, darker in the middle, with two brown median parallel lines and with a dark brown patch over the roots of the wings, a small silvery-blue spot in front of the root of each wing, the mesonotum covered sparsely with very small, curved, black scales, and small black bristles

over the roots of the wings and forming two distinct lines down the mesonotum; scutellum pale chestnut-brown, with flat black scales (partly denuded); metanotum deep brown in the middle, pale ochraceous-brown at the sides; pleuræ pale ochraceous.

Abdomen dark brown, with blackish-brown scales and pearly apical spots, showing pale blue at times; venter ochraceous.

Legs brown, the mid femora swollen, in the hind legs the last two and the greater part of the apex of the antepenultimate tarsal joints white; unguis small, equal and simple; in some lights the fore and mid tarsi appear pale in colour and rather shiny.

Wings with brown scales, the median ones small and truncated, in a single row, a few long thin lateral ones, scales at the base of the fifth, and a few at the base of the fourth metallic-blue in certain lights; first sub-marginal cell very small, the second long vein close to the first long vein, the stem passing some distance past the supernumerary cross-vein; second posterior cell larger than the first sub-marginal, but small; posterior cross-vein about its own length distant from the mid cross-vein, close to the base of the upper branch of the fifth long vein; halteres with an ochraceous stem and fuscous head.

*Length*.—1.5 mm.

*Habitat*.—St. Lucia.

*Time of capture*.—February.

*Observations*.—Described from two specimens sent by Dr. Low to Dr. Rees. It is a very distinct species, which can be easily told by the thoracic ornamentation and the white hind tarsi. Dr. Low bred them from larvae taken in a pool at the Cemetery, St. Lucia, and mentions that the larva is peculiar.

#### URANOTAENIA SOCIALIS. n. sp.

Thorax deep chestnut-brown, with a metallic mauve median line ending at the bare space in front of the scutellum, a similar coloured patch in front of the root of each wing and a small median one on the scutellum. Abdomen black, unbanded and unspotted, but sometimes showing a pearly apical patch on the fifth or sixth segment. Legs blackish, unbanded, but with a white knee spot and white speck at the tip of the tibiae. Wings with a pale blue tint at the root of the fifth long vein.

♀. Head dark, covered with flat black scales and flat metallic-blue ones bordering the eyes in the middle; clypeus fawn coloured; palpi brown, very hairy; antennæ brown with grey bands, basal joint bright testaceous; proboscis black, swollen apically.

Thorax brown, with a yellowish and chestnut tinge, with very small bronzy-brown scales, a median row of small flat blue

scales ending before the bare space in front of the scutellum, another long patch just in front of the roots of the wings and some just underneath, on each side of the median blue line a row of black bristles, also a lateral row and others at the sides; scutellum dark brown in the middle, ochraceous at the sides, the

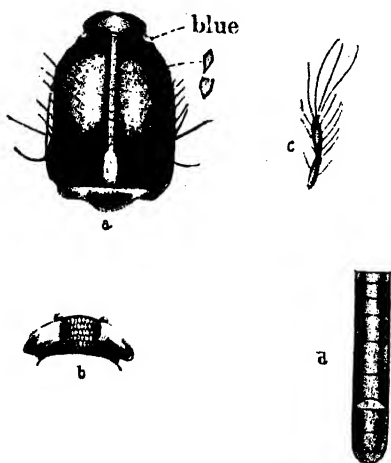


Fig. 316.

*Uranotaenia socialis*. n. sp.

a, Head, prothoracic lobes and mesothorax; b, head (smaller scale than a); c, palp of ♀; d, abdomen of ♂.

mid lobe covered with flat blue and brown scales, the lateral with a few black scales; metanotum bright, clear brown; pleurae pale brown, with a small patch of blue scales; the prothoracic lobes are small but covered with flat blue scales.

Abdomen steely-brown, covered with rather irregular black scales, venter greyish.

Legs dark brown, the fore and mid femora swollen, coxae and venter of femora pale, apex of femora with a snow-white spot, largest in the hind legs, apex of tibiae with a smaller snow-white spot; unguis small, equal and simple.

Wings with brown scales except at the base of the fifth long vein, where there is a long patch of clear blue scales, almost white in some lights; upper border of wing, sub-costal, and first long vein densely deep brown scaled, second long vein close to the first, its fork-cell small, its lower branch with large *Taeniorhynchus*-like lateral scales, its stem passing well into the basal cell and some way past the marginal transverse vein, third long vein with long *Taeniorhynchus*-like scales along all the upper side and partly along the lower; the branches of the second posterior cell with similar lateral scales, the second posterior cell much larger than the first sub-marginal; posterior cross-vein considerably



longer than the mid cross-vein, about its own length distant from it.

Halteres with ochraceous stem and fuscous knob.

*Length*.—2.2 mm.

♂. Ornamented as in the ♀; antennae deep brown, with grey bands and deep brown plume-hairs, basal joint brown; palpi deep brown; proboscis nearly black; eyes widely separate, the frons covered with flat blackish-brown scales. Abdomen black, the sixth segment with an apical pearly patch. Ungues of the fore legs very slightly unequal, small; mid ones unequal, the larger fully developed, sickle-shaped, simple; the hind unguis small, simple, slightly unequal.

*Length*.—2 mm.

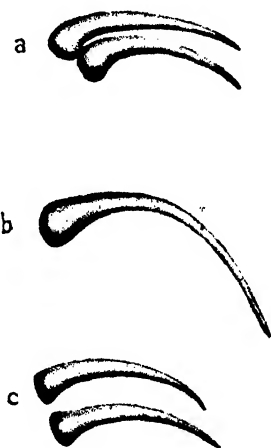


Fig. 317.

*Uranotaenia socialis*. n. sp.

Fore, mid and hind unguis of ♂

*Time of capture*.—March (Grabham) (11).

*Habitat*.—Jamaica.

*Observations*.—Described from a series sent by Dr. Grabham. It is very close to *U. Nataliae* of Arribalzaga, but differs from it in having only one pearly abdominal band.

The species can easily be told from the other *Uranotaeniae* of the West Indies and South America by this character and by the unbanded legs, with the white knee and tibial spots which sometimes show pale blue. Dr. Grabham writes: "Found in association with *Anopheles* larvae in stagnant permanent pools, about the Kingston district. I have not been able to persuade this form to feed from my finger when placed in the netting of the breeding jar."

GENUS *BRACHIOMYIA*. nov. gen.

Head covered with very thin, narrow curved scales, all pointing forwards; mesothorax and scutellum with small, narrow curved scales. Antennae of the female 14-jointed, very long and filiform, the second joint long, the succeeding joints gradually becoming shorter, apical joint globose-oval; the second to fifth joints densely covered with scales and with longish hairs, remaining joints with shorter hairs and no scales, verticillate

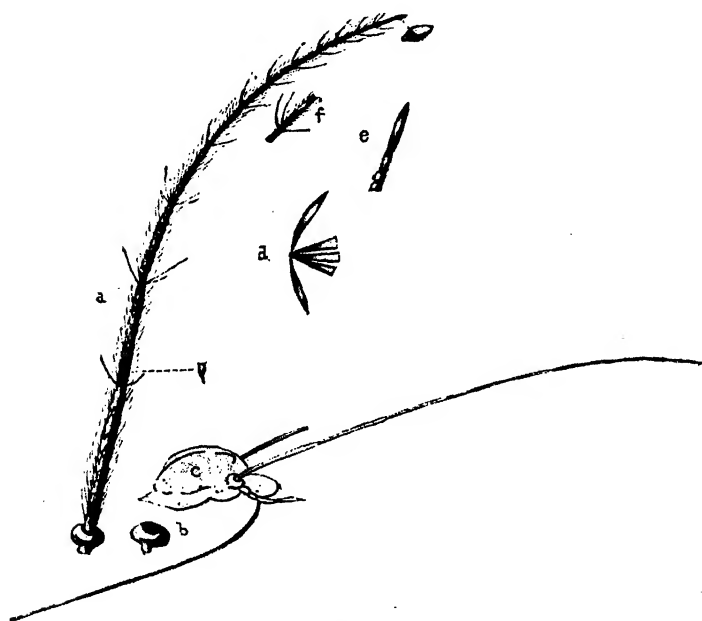


Fig. 318.

Genus *Brachiomysia*.

a, Antenna; b, basal joint; c, head, side view; d, wing scales; e, ♀ palpus;  
f, antennal joint.

hairs scanty and short, basal joint globose, bare. Palpi short, 4-jointed, apical joint the longest, the two basal joints small; clypeus prominent, nude; proboscis long, but not so long as the body. Legs, with the fore and mid femora swollen; fore and mid ungues of the ♀ equal and simple, the fore ones straighter than the mid. Wings with venation as in *Culex*, the scales rather thick, either truncated (in middle of veins) or lanceolate laterally.

Several specimens have been received. They differ from all other *Culicidae* in the peculiar structure of the antennae and most nearly approach the genus *Deinocerites*. The female only has been taken.

BRACHIOMYIA MAGNA. n. sp.

Brown; thorax rather shiny; abdomen unbanded, paler beneath; legs rather long and thick, unbanded; antennae considerably longer than the body.

♀. Head brown with narrow, grey, curved scales, all pointing forwards, with numerous upright, ochraceous, forked scales, rather broad and crenulated at the summit; two black bristles projecting between the eyes and several overhanging them; eyes deep purplish black; clypeus fawn-coloured, nude; proboscis brown, moderately long, prominently curved downwards; antennae very long and filiform, longer than the whole body, brown, basal joint bright ochraceous, second to fifth joints covered with small brown scales, especially thick towards their base, the second joint long, the following gradually becoming shorter towards the apex. Palpi short, 4-jointed, covered with brown scales, the basal joints the smallest, a few black hairs also on the joints.

Thorax shiny brown, with sparse, narrow, curved, small, greyish-brown scales and short deep-brown bristles; scutellum chestnut-brown with narrow, curved, greyish-brown scales; metanotum nude, deep brown, except at the base, where it is chestnut-brown; pleurae pale ochraceous, with pale brown mottling and black bristles.

Abdomen shiny steely-grey, covered with dull brown scales, which show violet reflections; the last two apical segments have numerous scattered ochraceous scales as well; venter paler, covered with dull ochraceous scales.

Wings with the veins clothed with rather short and moderately thick brown scales, with convex extremities and also with some longer and thinner lateral ones, but not nearly so thin as in *Culex*; first submarginal cell a little longer and narrower than the second posterior cell, their bases about level, stem of the first submarginal nearly half the length of the cell, that of the second posterior cell two-thirds the length of the cell; posterior cross-vein rather more than its own length distant from the mid cross-vein; the sub-costal reaches the border of the wing level with the base of the first sub-marginal cell; halteres with pale ochraceous stem and fuscous knob.

Legs with the coxae and trochanters pale ochraceous; fore and mid femora rather thick, posterior femora thinner, brown above, pale ochraceous beneath, a row of bristles on each side, fore, mid, and hind tibiae brown with a few bristles, metatarsi

and tarsi brown; unguis of fore and mid legs equal and simple, rather straight, the mid rather shorter and more curved than the fore unguis (hind ones broken); between the claws is a very distinct and large yellow empodium.

*Length*.—4.5 mm.

*Habitat*.—St. Lucia (Low, per Daniels).

*Observation*.—Described from a single ♀. It is very marked and differs in several respects from any other *Culex*, especially in (i) the long antennae, (ii) the unguis, and (iii) the swollen fore and mid femora. I have thus placed it in a separate genus, which lies nearest to the *Deinocerites* from Jamaica, and from which it differs in the (a) structure of the antennae, the second to fourth joints being scaly and in the joints gradually shortening to the apex, (b) in the structure of the unguis and in the swollen fore and mid femora, which are of normal size in *Deinocerites*.

A number of fresh specimens have been received since this description was drawn up.

## GENUS SABETHES. Robineau Desvoidy.

(Page 247, Vol. I.)

Head clothed with large flat scales; palpi short in both sexes, slightly longer in the ♂ than in the ♀, but never more than one-fourth the length of the proboscis; palpi and proboscis with large flat scales; antennae 14-jointed in the ♂ and ♀, pilose in both sexes, rather more so in the ♂ than in the ♀; clypeus nude; proboscis of moderate length. Prothoracic lobes covered with large flat scales; mesonotum with small and large flat scales, with their apices very convex, back of the mesonotum and scutellum with dense large flat scales; metanotum with chaetae on the posterior half.

Abdomen completely covered with flat scales, posterior border-bristles very small, the apex in both sexes densely spiny.

Legs simple in the ♀, in the ♂ with dense paddle-like masses of scales on one or more pairs; unguis in both sexes small, equal and simple.

Wings with the veins covered with rather broad, dense asymmetrical scales; fork-cells long in both sexes; the stem of the first sub-marginal cell extending a long way back towards the base of the wing; mid cross-vein a little nearer the apex of the wing than the supernumerary; posterior nearer the apex than the mid in the ♂, less so or nearly in a line with it in the ♀.

The ♀'s might easily be mistaken for *Wyeomyia*, but they can at once be told by the asymmetrical wing scales, whilst in *Wyeomyia* the wing scales are symmetrical, and by the cross-veins in *Wyeomyia* being like *Culex*, that is the supernumerary and

mid united at an angle, the third long vein not being carried through into the basal cell, whilst the second long vein is carried past the humeral cross-vein.

The genus *Sabethes* comes in the sub-family *Aedeomyia*, the palpi being short in both sexes; having chaetae on the metanotum, they resemble *Wyeomyia*. This latter genus is very close to *Sabethes*, but the peculiarity of the wing scales and cross-veins is sufficient to separate them. Until Dr. Durham brought back some fresh material from Para I could not make a proper examination of any member of this genus, the two ♂'s I examined being mounted in such a way that I could not detect the metanotal bristles or palpi, and I had seen no females. Moreover, I was not, until Dr. Durham's material arrived, certain of the sex of the two specimens I had seen. One in the British Museum was labelled a ♀ of *S. remipes*. Not being able to see the genitalia I was unable to decide to which sex it belonged; it subsequently proved to be a ♂, the ♀'s having simple legs, not armed with paddles.

Dr. Durham informs me *Sabethes* are most brilliant when on the wing and that they are not purely sylvan. Those that he took came into the hut in which he and his companions were making observations.

#### SABETHES REMIPES. Wiedemann.

(Page 248, Vol. I.)

♀. Head clothed with flat dark brown scales; antennae dark brown, almost black basal joint with grey tomentum; palpi short dark brown, with metallic reflections; clypeus with grey tomentum; proboscis black.

Thorax black, clothed with small flat bronzy green, dull purple and a few blue scales; scutellum with deep violet to black scales; metanotum black; pleurae black.

Abdomen covered with deep metallic purplish black scales; venter pale dull yellowish; apex bristly.

Legs deep metallic violet, brown and purple; in the mid legs the ventral surface of the first, second and third tarsi, silvery white, apical one black; ungues equal and simple.

Wings with the veins clothed with typical *Sabethes* scales; fork-cells long; the first sub-marginal cell longer and narrower than the second posterior cell, base of the latter a little nearer the base of the wing than that of the first sub-marginal; stem of the first sub-marginal less than half the length of the cell; stem of the second posterior cell also less than half the length of the cell; mid cross-vein nearer the apex of the wing than the supernumerary, posterior cross-veins a little nearer the apex than the mid and longer than the mid; second long vein carried past the humeral cross-vein.

Halteres dark brown.

Length.—5 mm.

Habitat.—Para (Durham).

Observations.—Described from a single ♀ brought back by Dr. Durham. It is much darker than the ♀ of *S. nitidus*, and the relative positions of the cross-veins and bases of the fork-cells differ.

SABETHES NITIDUS. n. sp.

♀. Head with peacock blue and green scales with a row of thick short dark brown bristles projecting forwards over the eyes; palpi very short, brown, with a few spines at the apex; proboscis dark brown, rather swollen at the apex, minutely hairy; clypeus frosty grey; basal joint of antennae frosty grey, remainder brown, densely pilose, but not much more so as in the ♀, joints much about the same length.

Thorax black, with flat peacock-blue and green scales, the back of the mesonotum and scutellum covered with large flat metallic green and bronzy scales, a tuft of dark scales just in front of the root of the wing. Metanotum dark brown, almost black, with four deep brown chaetae; pleurae black, with a large patch of white scales.

Abdomen with the basal segment metallic green, remainder brilliantly coloured with green, mauve, blue, white and yellow: the colouring varies in different lights; when viewed from above the abdomen is deep metallic blue with basal coppery bands; when viewed laterally the abdomen is bright apple green, with basal mauve bands and white basal lateral spots and yellow venter; now and then, as the sun strikes the scales, red and yellow colours appear; the apex of the abdomen is provided with dense brown bristles.

Legs metallic blue and violet or rich purple; coxae dark, with patches of white scales; the legs are not provided with paddles; last three mid tarsi white underneath; unguis small, equal and simple.

Wings clothed with similar formed scales to the ♂; fork-cells long, the first sub-marginal longer and narrower than the second posterior, its base a little the nearer the base of the wing, its stem less than half its length and shorter than the stem of the second posterior cell; mid cross-vein nearer the apex of the wing than the supernumerary and longer, posterior cross-vein level with and longer than the mid.

Halteres dark brown.

Length.—5 mm.

♂. Head clothed with metallic green and blue scales; palpi and proboscis brown. Abdomen metallic blue with golden ventral and lateral patches, the patches being somewhat apical.

Legs much as in *S. remipes*; the mid pair with large paddle-like masses of scales, the paddle blackish, except at the apex, where it is creamy white, most of the metatarsal portion being white, the leg itself is scaled with violet and purple scales; fore and hind legs simple, the hind with the tibiae rather expanded apically; unguis small, equal, and simple. The legs show brilliant colours at times.

Wings with typical brown *Sabethes* scales; first submarginal cell longer and narrower than the second posterior cell, its base considerably nearer the base of the wing than that of the latter; the stem rather less than one-third the length of the cell; stem of the second posterior cell nearly as long as the cell; super-numerary and mid cross-veins practically meeting in an open angle, posterior cross-vein a little longer than the mid and nearly in a line with it.

*Length*.—5 mm.

*Habitat*.—Para, Brazil (Durham).

*Observations*.—Described from several ♀'s and a single ♂ caught by Dr. Durham; the ♂ was unfortunately broken in mounting.

It is clearly a distinct species easily told in the ♂ by the white tipped paddle and by the position of the cross-veins in both sexes. It most nearly approaches *S. remipes*, the mid legs of the ♂ only being paddled.

## GENUS **WYEOMYIA**. Theobald.

(Page 267, Vol. II.)

### **WYEOMYIA LUTEOVENTRALIS**. n. sp.

Thorax unadorned with long broad dusky scales, on a deep testaceous brown surface, pleurae ochraceous with white scales; abdomen black dorsally, ochraceous to nearly white ventrally, unadorned. Legs deep brown, hind metatarsi shorter than the hind tibiae. Wings densely scaled with rather broad scales.

♀. Head covered with flat dark-brown scales, a pale border round the eyes and a white line between them, a few black bristles laterally and a few projecting forwards between the eyes; clypeus black with frosty tomentum; palpi small, covered with black scales; proboscis deep brown; antennae deep brown, the basal joint frosty grey on one side, verticillate, hairs black, pubescence pallid.

Thorax deep testaceous-brown with long broad dusky scales, ending convexly, the scales being loosely and irregularly disposed; scutellum bright testaceous with similar scales; metanotum

bright testaceous with a tuft of several brown bristles; pleurae ochraceous with numerous white scales.

Abdomen covered with dusky black scales above, ochraceous below; the first segment bright testaceous with a few scales showing violet reflections; apex with black bristles.

Legs deep brown more or less with metallic sheen, bases pale ochraceous; ventral surface of femora pallid; hind metatarsi shorter than the hind tibiae; unguis small, equal and simple.

Wings with the veins covered with rather broad dense brown scales; blackish along the costa and first long vein; bases of the wings very pale; fork-cells long, the first sub-marginal longer and narrower than the second posterior, its base considerably nearer the base of the wing than that of the second posterior, stem of the latter nearly as long as the cell; stem of the first sub-marginal rather less than one-fourth the length of the cell; posterior cross-vein not quite its own length distant from the mid; halteres with pale ochraceous stem and fuscous knob.

Length.—3.5 mm.

Habitat.—Para, Brazil (Dr. Durham).

Observations.—Described from three ♀'s taken by Dr. Durham. It is a very distinct species easily identified by the curious irregular thoracic scales. It comes near *W. Grayii* in the absence of abdominal ornamentation, but can at once be told from it not only by the thoracic scales, but also by the wing scales, which are much broader, more of the type of *W. lunata*, which it most nearly approaches structurally, and from which it may be told by the absence of abdominal lateral spots.

#### GENUS LIMATUS. nov. gen.

Head covered with flat scales; proboscis of moderate length slightly swollen apically; clypeus nude; palpi very small in the ♀; antennae with nude basal joint, 14-jointed, each joint with one basal row of verticillate hairs. Thorax densely clothed with large flat scales of two sizes, very convex at their free end; prothoracic lobes densely clothed with flat scales and with a row of bristles; scutellum densely clothed with flat scales, tri-lobed with four large and two small chaetae to the mid lobe; metanotum with both chaetae and squamae; abdomen covered with flat scales, posterior border-bristles small; legs rather long and thin, unguis small, equal and simple. Wings with rather broad, elongated, more or less conical scales, the free end broad and convex, some are slightly asymmetrical; fork-cells long, cross-veins as in *Culex*, that is the supernumerary and mid meet at an



obtuse angle and the posterior is nearer the base of the wing than the mid ; the sub-costal joins the costa at about half the length of the wing.

This genus is founded on some specimens brought back by Dr. Durham from Brazil, unfortunately all females. It is closely related to *Sabethes*, *Wyeomyia* and *Trichoprosopon*. From the two former it can be separated by the presence of scales on the metanotum, from *Trichoprosopon* by the absence of bristles on the clypeus, and on the basal lobe of antennae, by the position of the cross-veins and by the shortness of the palpi.

No ♂'s have been found.

The genus comes in Section C, page 98, Vol. I., on account of the scaly metanotum, even if the ♂ palpi are short.

It is a sylvan species. Nothing is known of its life history.

#### LIMATUS DURHAMII. n. sp.

Thorax ornamented with violet, golden-yellow and bronze, the golden-yellow forming three patches, looking like the top of a cross. Abdomen almost black, with basal lateral white triangular spots, venter creamy white. Legs bronzy-brown unbanded. Bases of the wings pale yellowish.

♀. Head covered with flat bronzy-brown and dull ochraceous scales ; sides of the head white ; clypeus brown ; proboscis black ; palpi and antennae brown.

Thorax with dense flat scales, very convex at the apex ; prothoracic lobes clothed with golden yellow flat scales and rich brown bristles ; mesothorax clothed with rich purple scales and with a golden yellow median line on the front half, and a lateral transverse line on each side, the anterior border and sides also with golden yellow scales, back portion of the mesothorax with duller purple and brown scales and a few golden ones ; scutellum with flat purple scales, border-bristles golden-brown, there being four large ones to the median lobe and two median small ones ; in front of the roots of the wings is a small tuft of black bristles and a golden-brown tuft behind ; pleurae with silvery-white scales ; scutellum with a tuft of golden-brown bristles on its apical half and two rows of small flat golden scales.

Abdomen black with basal white lateral spots ; first segment with creamy yellow scales ; venter creamy white, apex slightly bristly.

Legs dark brown with bronzy reflections, bases of the legs and ventral surface of the femora creamy white ; ungues small, equal and simple.

Wings with the veins covered with rather broad long dark scales, with the apices either flat or convex, the former slightly asymmetrical ; fork-cells long, the first sub-marginal considerably

longer and slightly narrower than the second posterior, its base much nearer the base of the wing than that of the second posterior, its stem about one-third the length of the cell; stem of the second posterior rather more than two-thirds the length of the cell; supernumerary and mid cross-veins united at an obtuse angle; posterior cross-vein not quite its own length behind the mid.

Halteres mostly black, basal part of stem yellow.

Length.—3 to 3.5 mm.

Habitat.—Para, Brazil (Dr. Durham).

Observations.—Described from a series caught by Dr. Durham. It is a most beautiful species with brilliant thorax, the three golden marks on the mesonotum looking like the upper part of a cross. Females only have been received. They seem to be intermediate between *Sabethes* and *Trichoprosopon*, but clearly come in the same section as the latter owing to the metathoracic scales, but they differ from *T. nivipes* in that the venation is of *Culex* type.

## NOTES ON LARVAE AND PUPAE.

### The larva and pupa of *Megarhinus*.

Two fresh specimens of a *Megarhinus* larva have been sent from Grenada by Dr. N. S. Durrant, and also three dried larval and two pupal skins. The larva is chiefly peculiar in that there are no prominent anal flaps. The larvae when mature reach 16 to 18 mm. in length; the head is large and of a bright chestnut-brown, it can apparently be completely rotated, and in the two specimens sent in spirit is peculiarly tucked in above the body; the antennae are pale brown, cylindrical and narrow with a single lateral and a few apical bristles; the mandibles are multiserrated, almost black; the metastoma or under lip is dark brown and smooth edged, on the venter of the head is a median sulcus and a dark chitinous ring at the nape; dorsally the head is smooth, contracted laterally towards the front, where it is bluntly truncated; the brushes arise from prominent chitinous projections; the brushes are dark brown, the basal projections testaceous, each brush is composed of a few thin lamellae, which lie close together and look like two brown curved horns when viewed with a lens. The basal lobes of the antennae are large, the antenna arise from a small grey area and are narrow and cylindrical.

The thorax is large and shiny, deep purplish-brown, considerably wider than the head; laterally are three forwardly projecting tubercles each bearing a spine jagged at each side and two long hairs; above these come two rows of spines and hairs, the uppermost row composed of a distinct spine arising from a tubercle and a thin hair, the median row of single spines.

Abdomen deep purple, composed of nine distinct segments, the eighth segment is small, each segment with a transverse row of lateral plumose bristles; ventrally the abdomen is much paler in colour; respiratory siphon situated on the dorsum of the small eighth segment, about as long as the two last segments combined, on its posterior side near the base are two tufts of plumed hairs, the apex ending in four leaf-like expansions, the two posterior ones being large, the anterior small; anal segment bright chestnut-brown abruptly truncated with a thick spiny black dorsal bristle on each side, a long apical dorsal tuft of bristles and a moderately large ventral fan; the edge of the segment with a fringe of short black bristles forming a lateral swelling on each side; gill-plates very small in the form of four rounded knobs.

The *Pupa*. A dried empty skin only has been received, there are two broad anal plates and the respiratory siphons are long, narrow and cylindrical, the opening being slightly oblique. The specimen is too damaged to describe fully.

Larvae have also been received from Queensland, sent by Dr. Bancroft, but were handed over to me too late to describe. They are evidently those of *M. speciosus*, and are of a similar colour to the one just described.

### The larva and pupa of *Psorophora*.

Professor Howard figures the larva and pupa in his recent work on mosquitoes.\* The larva is of *Culex* type, but the anal plates are longer and more pointed, and the hair fringe on the under side of the last segment of the body is much longer and denser; the siphon is prominent and intermediate in size between *Stegomyia* and *Culex* and bears a rather long hair on one side; the head is not quite as wide as the thorax and has four feather bristles in front; the antennae have a few spines on one side and a single lateral hair near the apex when mature; in the young larva there is a small tuft of hairs on the side of the antennae and four bristles at the apex, three small and one long; the thorax is more or less globose when mature, broadened and quadrangular when young, slightly wider than the abdominal segments in the adult larva, considerably wider in the young

\* 'Mosquitoes.' L. O. Howard, New York (1901).

stage ; the abdominal segments are all much about the same size, but the last two are smaller. The lateral bristles are simple and there are small dorsal feather-tufts on the posterior portions of the segments. The mouth parts are said by Professor Howard to be quite different to those of *Culex*. The jaws are shapely, toothed and very long.

The pupal stage was found by Professor Howard to last from four to five days. The pupa has the two siphons with slightly oblique openings, more like *Anopheles* than *Culex*, judging from Howard's figure (fig. 41, g). The larvae were found in small depressions in the bed of a small stream and similar hollows in certain small ponds, all of which were dry a greater part of the summer.

### Notes on the larva of *A. argyrotarsis*, sub. sp. *Albipes*.

Dr. Grabham sends the following note on the external appearance of the larva of this *Anopheles*:—"The majority present quite a different type of ornamentation, being marked on the thorax with a V-shaped silvery mark and two silvery semicircular marks on each side of the second and fifth abdominal segments. These marks may be present in any order. In some only the thoracic one is present, in others either one or both abdominal marks, alone or with the thoracic. They vary greatly in brilliancy and are sometimes only visible with difficulty. Occasionally they are absent altogether."

## SOME ADDITIONAL GENERAL NOTES AND FURTHER LOCALITIES.

### Absence of *Anopheles* in Seychelles and Barbados.

Two notes have been sent regarding absence of *Anopheles* and *malaria* in Seychelles and Barbados.

(i.) "I have so far not been able to catch a single specimen of the *Anopheles*, and in the presence of the investigation of Dr. Ross it is to the absence of this insect that I consider the immunity of this island from malarial fever is due.

"I know that cases of filarial disease occur from time to time Seychelles, but I do not happen to have a case under observation just now. I am unable to state to which of the species

forwarded to attribute its propagation." Robert Denman, Chief Gov. Med. Officer, Seychelles (156<sup>2</sup>, 93<sup>1</sup> and 93<sup>2</sup> Reg. No.).

(ii.) "Low sends a batch of mosquitoes from Barbados. He has failed to find any *Anopheles*. There is no malaria there." (Dr. Daniels).

### Note on the Mashonaland Collection No. 7 (No. 79).

"The Mashonaland specimens obtained by Mr. Marshall, F.Z.S., were mostly taken in Salisbury itself and in the neighbouring districts of Mezoe and Enterprise, both distant about twenty-five to thirty miles from Salisbury. These two districts are both malarious and have a large area of swampy ground during the wet season. Mosquitoes are much more prevalent in some parts of Rhodesia than in others, and there has been some difficulty in forming complete collections of the different species owing to the distance the collector has to travel in some cases, whilst in other districts they are extremely common." (Extract letter from A. Fleming, Med. Director, B.S.A. Co., 1587, 25th August, 1900).

#### ANOPHELES SUPERPICTUS. Grassi.

*Additional locality*.—Tyre and Sidon (Cropper).

#### ANOPHELES SINENSIS. sub. sp. *pseudopictus*. Grassi.

*Additional locality*.—Palestine (Cropper).

#### ANOPHELES MACULIPENNIS. Meigen.

*Additional locality*.—Palestine (Cropper). Very small specimens.

#### STEGOMYIA FASCIATA. Fabr.

*Additional localities*.—Old Calabar; April (Annett); Tyre and Sidon, Palestine (Cropper).

#### STEGOMYIA AFRICANA. Theo.

*Additional locality*.—Duke Town; April (Annett).

#### JANTHINOSOMA MUSICA. Say.

*Additional localities*.—Para, Brazil (Durham); British Guiana (Low).

## CULEX ANNULATUS.

"Repeated attempts were made with the *C. annulatus*, but they could not be induced to bite." M. J. Wright, "B. M. Journal."

## CULEX NEMOROSUS.

"Ready to attack at any part of the day, even in bright sunshine." M. J. Wright, "B. M. Journal."

## CULEX CONFIRMATUS. Arribalzaga.

*Additional localities.* — Jamaica (Grabham) (111); Para, Brazil. (Durham).

Dr. Grabham writes: "Plentiful in the Red Hills to the west of Kingston; is a voracious bloodsucker; the specimens were caught on a pony while waiting in a wood. It is easily recognised by the bright shiny patch of scales on the anterior aspect of the thorax."

## CULEX SPATHIPALPIS. Rond.

*Additional locality.*—Palestine (Cropper).

## CULEX MIMETICUS. Noe.

*Additional localities.* — Palestine (Cropper); Penang (Dr. Wright).

## CULEX PULCRITARSIS. Rond.

*Additional locality.*—A single ♀ from Palestine (Cropper).

## CULEX FATIGANS. Wied.

*Additional localities.*—Palestine (Cropper); Barbados (Low).

## CULEX PAPIENS. L.

*Additional locality.*—Palestine (Cropper).

## TAENIORHYNCHUS RICHARDII. Fic.

*Additional locality.*—Palestine (Cropper).

## DEINOCERITES CANCER. Theo.

"Breeds in swarms in the crab-holes along the seashore. The water in the crab-holes is distinctly brackish. Very slothful in flight, only comes out to feed at night; is a voracious blood-sucker." (Dr. Grabham).

## WYEOMYIA GRAYII. n. sp.

*Additional locality*.—Jamaica (Grabham), 111.

"A delicate, long-legged form," writes Dr. Grabham, "very plentiful with *Culex confirmatus* in the Red Hills. It adopts the attitude of an *Anopheles* when settled and has a peculiar habit of throwing its hind legs right forward, more so than other mosquitoes I have observed here, when in the act of sucking. It is an energetic blood-sucker. The wings have a greenish lustre."

LIST OF THE COLLECTIONS OF MOSQUITOES  
RECEIVED AT THE BRITISH MUSEUM UP  
TO THE PRESENT TIME, EITHER THROUGH  
OFFICIAL OR PRIVATE SOURCES.

No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
1	Delagoa Bay— S. R. Christophers	39 Culex and 5 other Diptera	303/99	13 Feb. 1899
2	Bombay— C. W. Daniels	32 Culex, 36 Anopheles	443/99	6 Mar. 1899
3	British Guiana, New Amsterdam— Dr. E. D. Rowland	8 Culex	..	4 Apr. 1899
4	Pará— W. S. Churchill, H.M. Consul	47 Culex	670/99	12 Apr. 1899
5	Queensland, Burpengary, <i>viâ</i> Brisbane— Dr. T. L. Bancroft (2nd consignment)	Large number of Culi- cidae, too damaged to identify .. ..	.. ..	8 May 1899 15 May 1899
6	St. Vincent, B.W.I., Bo- tanic Station— H. Powell	40 Culex	935/99	25 May 1899
7	St. Lucia, B.W.I., Cas- tries— St. George Gray, M.B.	24 Culex	..	25 May 1899
8	Queensland, Burpen- gary— Dr. T. L. Bancroft (3rd consignment)	4 glass tubes contain- ing Culicidae, much damaged	..	29 May 1899
9	Pará— W. S. Churchill, H.M. Consul (2nd consignment)	50 Culex	..	8 June 1899



No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
10	Queensland, Burpengary— Dr. T. L. Bancroft (4th consignment)	7 bottles and 1 small tin box, containing quite 100 Culex and Anopheles	..	10 June 1899
11	St. Vincent— H. Powell (2nd consignment)	48 Culex	1017/99	10 June 1899
12	Demerara— J. J. Quelch (through Governor and Colonial Office)	64 Culex	1054 and 1057/99	16 June 1899
13	St. Lucia, Castries— St. George Gray, M.B. (2nd consignment)	39 Culex	..	23 June 1899
14	Brazil— Dr. A. Lutz, of the Bacteriological Institute of the State São Paulo. (Through the British Consulate, Rio de Janeiro. W.G. Wagstaff, Consul-General)	3 Anopheles, 3 Culex, and 13 other Diptera mounted; 1 Anopheles, 28 Culex, and 4 Diptera in bottles	1204/99	4 July 1899
15	Montserrat, Leeward Islands— F. L. Norris	22 Culex	1195/99	7 July 1899
16	Japan, Tokyo— C. H. B. Woodd	25 Culex, 1 other Dipteron	..	4 July 1899
17	Malta— Dr. T. Zammit, Medical Officer of Health	7 Culex, 49 other Diptera	1129/99	11 July 1899
18	St. Lucia, Castries— St. George Gray, M.B. (3rd consignment)	4 boxes containing 91 Culex, 15 other Diptera, 3 beetles, 2 moths	..	19 July 1899
19	New Zealand— Prof. R. I. Scott	15 Culex, and 1 other Dipteron	..	21 July 1899
20	Mexico, British Consulate— C. J. Biorklund, Acting Consul	Collection of mixed insects. No mosquitoes	1347/99	31 July 1899
21	Bermuda— G. Digby Barker, C.B., Governor and Commissioner-in-Chief. Dr. Eldon Harvey, Medical Officer of Health, Collector. Through Colonial Office	3 boxes—59 Culex, 16 other Diptera	1453/99	16 Aug. 1899

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No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
22	Kashmir— Dr. Ernest F. Neve, Mission Hospital	4 Culex, unmounted, in paper	1470/99	21 Aug. 1899
23	Singapore— Raffles Library and Museum (per R. Ha- nitsch)	53 Culex, 8 other Dip- tera	1541/99	4 Sept. 1899
24	Formosa, British Consu- late, Tamsui— R. de B. Layard, Con- sul, Dr. G. Mackay, Collector	33 Culex, 6 Anopheles, 2 other Diptera	1360/99	6 Sept. 1899 (see Reg. No. 1766/99)
25	Jamaica— F. Cundall, Secretary Jamaica Institute.	32 Culex	1590/99	15 Sept. 1899
26	Fiji— B. Glanvill Corney, Chief Medical Officer, Medical Department		1730/99	11 Oct. 1899
27	Panama, British Consu- late— C. Mallet, Consul	29 Culex	1598/99	22 Sept. 1899
28	Gibraltar— Sir H. Jackson, Colonial Secretary; Major Birt, Collector	60 Culex	1607/99	22 Sept. 1899
29	Fiji, Suva— Barclay Black, M.D. Forwarded by B. Glan- vill Corney, Chief Medical Officer	Remains of 1 Ano- pheles; 3 empty cards	1624/99	22 Sept. 1899
30	Hong Kong— Charles Ford (Botanical and Afforestation De- partment)	43 Culex, mounted; 50 Culex (about) in spirit. Probably all Culex.	1606/99	27 Sept. 1899
31	East Africa, Pema— D. R. O'Sullivan-Beare, British Vice-Consul	18 Culex, and 18 other Diptera	No letter (see Reg. No. 1742/99)	11 Oct. 1899
32	Fiji, Suva— Barclay Black, M.D. Forwarded by B. Glan- vill Corney, Chief Medical Officer	Mouldy, apparently all Culex, 29	1913/99	9 Nov. 1899
33	Ceylon— A. Perry, Principal Civil Medical Officer	9 Culex, 12 other Dip- tera, 1 Ichneumon	No letter	9 Nov. 1899

No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
34	Cayman Islands— Per G. I. Stuart Tait, Government Medical Officer. Through the Colonial Secretary, Jamaica	About a dozen mosquitoes, much damaged by mites	1989/99	10 Nov. 1899
35	West Africa, Bonny— Per I. P. Fagan, District Medical Officer, H.B.M. Vice-Consulate	270 specimens, unmounted, apparently nearly all Anopheles	2001/99	21 Nov. 1899
36	Mauritius, Government of— Per Sir Charles Bruce, K.C.M.G.	24 Culex, 2 other Diptera	1989 and 1997/99	22 Nov. 1899
37	Jamaica, Kingston— M. Grabham, M.D. (2nd consignment)	6 Culex, 4 Anopheles, much damaged .. ..	2084/99 2078/99	24 Nov. 1899 30 Nov. 1899
38	Cyprus— W. Hart Bennett, Acting Chief Secretary to the Government. Collected by P. Gennadius, Director of Agriculture	5 Culex, 6 other Diptera, 2 Hymenoptera	2125/99	7 Dec. 1899
39	Jamaica Institute— Per F. Cundall, Secretary (2nd consignment)	Box 1, about 14 pieces Culex and Anopheles; box 2, 26 Culex, 6 Anopheles; box 3, 25 Culex, 4 Anopheles	2126/99	7 Dec. 1899
40	Rio de Janeiro— Per W. G. Wagstaff, Consul-General. Collector, Senhor Carlos Moreira, Entomologist of the Nat. Mus., Rio	68 Culex, 12 other Diptera	2127/99	7 Dec. 1899
41	S. India, Travancore S. P. James, M.B., Cap. I. M. S.	1 Anopheles, and 5 empty cards	..	5 Dec. 1899
42	Queensland, Burpengary— Dr. T. L. Bancroft	2 boxes—6 Anopheles, 85 Culex; also 14 tubes, containing 150 to 200 mosquitoes and other Diptera	..	5 Dec. 1899
43	Madras— Dr. E. S. Goodrich, Oxford Museum	40 Culex, 3 Anopheles, 16 other Diptera	..	12 Dec. 1899

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No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
44	St. Lucia, W.I., Castries— Otho Galgey, M.R.C.P.I.	3 boxes—93 Culex, 9 Anopheles, 1 moth	2215/99	21 Dec. 1899
45	Ceylon— A. Perry, Principal Civil Medical Officer (2nd consignment)	32 Culex, 23 other Diptera .. ..	..	27 Dec. 1899 No letter
46	Fiji, Suva— Barclay Black, M.D. • (3rd consignment)	5 Culex (and 12 fragments)	2261/99	30 Dec. 1899
47	St. Lucia, Castries— St. George Gray, M.B.	16 Anopheles, 2 Culex, 4 other Diptera, 2 Hymenoptera; also small bottle with 4 larvae	..	6 Jan. 1900
48	Hong Kong— Charles Ford, Superintendent Botanical and Afforestation Department	42 Culex, 10 other Diptera, mounted; about 40 Culex in spirit	2236/99	8 Jan. 1900
49	Manitoba— Dr. Gordon Bell, Provincial Bacteriologist	11 Culex, 1 Anopheles	93/1900	19 Jan. 1900
50	Cairo— Dr. H. P. Keatinge (School of Medicine)	2 Anopheles	..	19 Jan. 1900
51	Straits Settlements, Taipang— L. Wray, junr.	66 Anopheles, 72 Culex, 53 other Diptera	..	22 Nov. 1899 and 21 Dec. 1899
51A	Sierra Leone, Freetown— E. E. Austen	104 Anopheles, 84 Culex	..	Nov. 1899
52	St. Lucia, Castries— St. George Gray, M.B.	3 Culex, 2 other Diptera, 2 moths	..	1 Feb. 1900
53	Jamaica— Dr. Grabham	32 Culicidae, good condition; no letter, notes in box	..	8 Feb. 1900
54	Selangor— A. L. Butler	51 Culex, 1 Anopheles, 3 other Diptera, good condition	..	28 Oct. 1899
55	St. Lucia, Castries— St. George Gray, M.B.	31 Culicidae, 14 other Diptera, 2 moths	..	3 Aug. 1899
56	British Guiana, New Amsterdam— Dr. E. D. Rowland	38 Culex, 1 Anopheles, some damaged by mites and mould	..	Sept. 1899

No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
57	Grenada— W. E. Broadway	100 Culicidae, fair condition	? 449/1900	14 Feb. 1900
58	Quilon, Travancore, S. India— Capt. S. P. James, I.M.S. 19th M.I., Quilon (2nd consignment)	85 Culex, 84 Anopheles, much damaged by mites	..	7 Mar. 1900
59	Mauritius— Dr. Rees	10 Culicidae, almost entirely destroyed	..	7 Mar. 1900
60	Lagos— Dr. Henry Strachan, District Medical Officer	5 or 6 fragments of Culex	..	17 Mar. 1900
61	British Guiana, New Amsterdam— Dr. E. D. Rowland	About 70 Culicidae	..	30 Mar. 1900
62	Granada— Walter J. Chambers, H.B.M. Consul; Mr. Deoclesiano Chaves, Managua, collector	Mixed Diptera, very much damaged	..	30 Mar. 1900
63	Grenada— W. E. Broadway	42 Culicidae, fair condition	624/1900	30 Mar. 1900
64	Trinidad— H. Caracciolo, per Hon. C. C. Knollys	Mosquitoes in spirit	625/1900	3 Apr. 1900
65	Mombasa— J. D. McKay, East Africa Protectorate	7 Culicidae, some broken	727/1900	17 Apr. 1900
66	Canada— E. M. Walker, 99, St. George St., Toronto, Ontario	2 boxes, 128 specimens, 92 Culex, 36 Anopheles, in good condition, brought by donor's father	728/1900	14 Apr. 1900
67	Penang, Straits Settlements— G. D. Freer, M.B. Lond., Colonial Surgeon Resident, General Hospital, Penang	5 Culex, 12 Anopheles	821/1900	30 Apr. 1900
68	Fiji— B. Glanvill Corney, Chief Medical Officer, Suva, Fiji. Collected by H. Noble Joynt, M.D., D.P.H.	Fragments of 21 Culex	885/1900	8 May 1900

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No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
69	Dacca— Collected by Lt.-Col. R. Macrae, I.M.S., assisted by Assistant-Surgeon Jogeesur Mukerjee. Forwarded by Col. T. H. Hendley, C.I.E., I.M.S., Surgeon-General of Civil Hospitals, Bongal	196 mosquitoes, <i>Culex</i> and <i>Anopheles</i> , nearly all in fragments, eaten by <i>Psoci</i>	820/1900	30 Apr. 1900
70	Italy— • Prof. Grassi	7 mosquitoes, typical named specimens of 4 species	..	11 May 1900
71	Queensland, Burpengary, <i>viâ</i> Brisbane— Dr. Thos. L. Bancroft	65 <i>Culex</i> , 15 <i>Anopheles</i> , 160 other Diptera, in fair condition	..	22 May 1900 No letter
72	Washington— L. O. Howard, Department of Agriculture	24 named Culicidae	1002/1900	26 May 1900
73	Punjab, Hushiapur— Dr. D. N. P. Datta, Civil Surgeon	15 <i>Culex</i> , and 6 small Homoptera, in fair condition	1054/1900	Letter, June 4; insects, June 11
74	Belize, Brit. Honduras— Colonial Secretary, per W. I. McKinney, Acting Colonial Secretary, Colonial Secretary's Office	32 <i>Culex</i> , 10 Tabanidae	918/1900	12 June 1900
75	Adelaide— Director of S. Australia Museum. Forwarded by Lord Tennyson, Governor of S. Australia, through the Colonial Office	43 <i>Culex</i> , and 31 Midges, in good condition	1153/1900	18 June 1900
76	Mombasa, The Fort— Lieut. I. D. McKay	33 Mosquitoes, with other insects. Poor condition	1127/1900	20 June 1900
77	Mombasa, The Fort— Lieut. I. D. McKay	20 <i>Culex</i> , with moths, &c., much mite-eaten, some in fragments	..	19 July 1900
78	Senegambia, &c.— Dr. Rees, Lond. School of Tropical Medicine	8 <i>Culex</i> from Senegambia, 4 <i>Culex</i> from the Albert Dock	..	21 July 1900

No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
79	Salisbury, Mashona-land— G. A. K. Marshall, F.Z.S., through Dr. Andrew M. Fleming, Medical Director, Brit. S. Af. Co., Salisbury	214 Culex, 42 Anopheles, 50 Chironomidae, 36 Tabanidae, 1 Megarhinus, 4 other Diptera	1587/1900	25 Aug. 1900
80	Victoria— C. French, Government Entomologist, Department of Agriculture, Melbourne, through the Colonial Office	31 Culex, and 43 other Diptera	1522/1900	9 Aug. 1900
81	Gold Coast, Saltpond— Osborne Browne, M.B., Assistant Colonial Surgeon	1 Anopheles, bred from larva	..	17 Sept. 1900
82	Brit. Cent. Africa, Chiroro— Dr. C. W. Daniels, Malaria Commission. Letter through C. P. Lucas, Colonial Office	57 Culicidae, 3 Tipulidae (dry), and 7 tubes with specimens in spirits. Brought by Dr. Daniels himself, 25 Sept. 1900	1657/1900	25 Sept. 1900 Letter, 18 Sept. 1900
83	Zomba, Brit. Cent. Africa— No information. Dr. Daniels saw them, and said they were from Dr. Gray	58 Culicidae	..	18 Sept. 1900
84	Foochow, China— T. Rennie	71 Culex, 9 Anopheles, in good condition	1704/1900	21 Sept. 1900
85	Mt. Kenia Expedition, Nairobi— H. J. Mackinder, Esq., and C. B. Hausburg, Collectors	20 Culex, 2 Psychoda	..	1 Oct. 1900
86	India, North West Provinces and Oudh— C. Hutcheson, M.D., Col. I.M.S., Inspector-General of Civil Hospitals	Only little fragments of 54 mosquitoes, useless. A paper pinned in the box bears the names— Capt. E. G. Morgan, Lt.-Col. C. C. Vaid	1745/1900	4 Oct. 1900

No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
87	Aberdeenshire, Torphins, Anamba Cottage— M. I. Wright, Esq., M.B., State Surgeon, Perabi	18 Anopheles, 32 Culex, in good condition	..	6 Oct. 1900
88	Mozufferpur, Behar, Bengal— Major C. R. M. Green, Indian Medical Service	28 Anopheles, 120 Culex, 10 other Diptera	1673/1900	8 Oct. 1900
89	Hong Kong— Dr. Manson, 21 Queen Anne St., Cavendish Sq., W.	20 Culex, in glycerine	..	18 Oct. 1900
90	New Zealand, Christchurch— Capt. F. W. Hutton, The Museum	12 Culex, named	..	19 Oct. 1900
91	Lagos— Dr. H. Strachan, Colonial Surgeon	18 Culex, 19 Anopheles	..	26 Oct. 1900
92	Logansport, Ind., U.S.A.— Robert Hessler, A.M., M.D.	8 Culex, 16 Anopheles, in spirit	2013/1900	2 Nov. 1900
93	Ceylon, Peradeniya— E. E. Green, Royal Botanic Gardens	5 Megarhinus, 18 Anopheles, 55 Culex, 9 other Diptera	2096/1900	16 Nov. 1900
94	Gorakhpur, N. W. P., India— Major G. H. Baker, I.M.S.	34 fragments	2040/1900	16 Nov. 1900
94A	São Paulo, Brazil— Dr. A. Lutz	A series of fragments	..	19 Nov. 1900
95	Antigua, Leeward Islands— W. R. Forrest	24 Culex, 2 Anopheles, 1 Strebla	..	23 Nov. 1900
96	Aberdeenshire— M. J. Wright, M.B., 83, Blenheim Place	4 Anopheles maculipennis, 6 Anopheles bifurcatus	..	24 Nov. 1900
97	Mukorian, Hoshiarpur, India— D. N. P. Datta, M.D., Civil Surgeon	3 Anopheles, 6 Culex	2295/1900	18 Dec. 1900



No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
98	Antigua, Leeward Islands— W. R. Forrest	12 Anopheles, 3 Culex	..	20 Dec. 1900
99	Sambalpur— D. O'C. Murphy, Civil Surgeon	22 Anopheles, 21 Culex	2386 and 2375/1900	27 Dec. 1900
100	Nigeria— The London School of Tropical Medicine, per Dr. Sambon. (Collected by Dr. A. H. Hanley)	14 Anopheles, 48 Culex	..	10 Jan. 1901.
101	Trinidad, Port of Spain— F. W. Urich, Esq., Education Department	34 Culex and allied genera (no Anopheles), 1 Limnobia	108, 1 & 2 1901	18 Jan. 1901
102	Etawah, N. W. P., India— Col. Hutcheson, M.D., I. M. S., Inspector-General of Civil Hospitals, Lucknow	55 Culex, 3 Anopheles, Collected by Major D. W. Scotland, I.M.S.	41/1901	26 Jan. 1901
103	Antigua, B. W. I.— W. R. Forrest, Esq.	1 Anopheles (and 2 fragments), 22 Culex, 8 Uranotaenia	..	31 Jan. 1901
104	Jamaica, Port Royal— J. F. Donovan, Esq., M.D.	12 <i>S. fasciata</i> . Fab. 1 Culex sp.	..	1 Feb. 1901
105	Jamaica, Kingston— Dr. Grabham	4 Anopheles, 6 Culex, 2 tubes containing larvae and pupae of Anopheles, 1 tube containing larvae of Culex, 1 tube containing Hemiptera, said to prey on mosquito larvae	..	4 Feb. 1901
106	Queensland, Victoria, N.S. Wales, Burpengary— Dr. A. L. Bancroft	2 Anopheles, 36 Culex	..	6 Feb. 1900
107	Victoria, Seychelles— Dr. Robert Denman, Chief Government Medical Officer	130 Culex	98, 1 & 2, 156, 2, 1901	14 Feb. 1901

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No.	Place and Name of Collector or Sender.	Specimens, &c.	Registered Number.	Received.
108	The Hospital, Midnapur, Bengal— Capt. B. H. Deare, I.M.S., Civil Surgeon. Per Col. T. H. Hendley, C.I.E., I.M.S., Inspector-General of Civil Hospitals for Bengal, Calcutta	A collection of pins, discs, and fragments of mosquitoes, all loose in box	249/1901	14 Feb. 1901
109	Barbados, W. I.— Dr. E. Howard Bannister, "Winterton"	40 Culex	..	29 Mar. 1901
110	Mount Fletcher, Cape Colony— Patrick Manson, Esq., M.D., F.R.S., 21, Queen Anne Street, Cavendish Square, W.	2 tubes containing Anopheles, 1 tube containing Anopheles larvae and pupae. Collected and forwarded by Dr. Martino Ricono	728, 1 & 2 1901	29 Mar. 1901

SPECIES OF WHICH THE DESCRIPTIONS  
HAVE NOT BEEN OBTAINABLE.

1. *Culex rufinis*. Bigot.  
Exp. Sci. Tunis. Dipt., p. 7. Tunis.
2. *Culex autumnalis*. Weyenbergh.  
Rio Primero. Monte Video. Los habitantes Vertebrados y Invertebrados del Rio Primero. Monte Video, 1882, p. 27.
3. *Culex dilatatus*. Fabricius.  
A specimen so labelled in the Hope Collection.
4. *Culex circumvolens*. Walker.  
Referred to in Tennant's Natural History of Ceylon.
5. *Culex contrahens*. Walker.  
Referred to in Tennant's Natural History of Ceylon.
6. *Culex pulicaris* (?).  
A specimen so labelled in the Hope Collection.
- \*7. *Culex anxifer* (?).  
Report of Museum, Colony of Mauritius, 1898-1899. No authority given.

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\* *Culex anxifer* (Big.) = *C. fatigans*. Wied.

# BIBLIOGRAPHY OF THE CULICIDAE, AND SUBJECTS RELATING THERETO.\*

- ALDROVANDO. De Animalibus insectis libri septem. Bononiae; apud Bellagambam, 1602.
- ARRIBALZAGA, E. L. Catálogo de los Dípteros hasta ahora descritos que se encuentran en las Repúblicas del Río de la Plata (Separat del Bol. Acad. Nac. d. Ciencias). Buenos Aires, Coni, 1883.
- ARRIBALZAGA, F. L. Dípterología Argentina. *Revista del Museo de La Plata* (Culicidae). La Plata, 1891.
- ARRIBALZAGA, F. L. Informe sobre una colección de Dípteros reunida en Las Conchas por D. Manuel Oliveira César, "El Naturalista Argentino." Buenos Aires, 1878.
- AUDOUIN, BLANCHARD, FOYERE et MILNE-EDWARDS. Les Insectes. Le Règne anim. distribué d'après son organisation; Ed. accompagnée de planches; par une réunion de disciples de Cuvier. *Diptera*. Tom. 11 & 12. Paris, 1849.
- AUSTEN, E. E. *Ento. Monthly Magazine*. Vol. 6, 1895. (*C. dorsalis*.)
- AUSTEN, E. E. Report of the Proceedings of the Expedition for the Study of the Causes of Malaria despatched to Sierra Leone, under Major Ronald Ross. British Museum, 1899.
- BARBUT, J. Les Genres des Insectes de Linné, constatés par divers échantillons d'Insectes d'Angleterre. London, MDCCLXXXI, pp. 306-310.
- BARTH, J. M. De Culice, Dissertatio. Ratisbonae, 1737.
- BASSETT-SMITH, P. W. Observations of Mosquitoes. *Journal of Tropical Medicine*. Vol. III., p. 53. 1900.
- BASTIANELLA. Vide Grassi, Bignani, &c.
- BECHER, E. Zur Kenntniss der Mundtheile der Dipteren. *Denkschriften der math. Naturw. K. Ak. der Wissenschaften zu Wien*. 1882.
- BELLARDI. *Mem. R. Accad. Torino*. Se. 2. XXII.
- BERGROTH. *Wiener Entomologische Zeitung* (1889), p. 295.
- BETTONI, E. Prodrumi della faunistica Bresciana. Brescia, 1884.
- BEZZI, M. Contribuzione alla Fauna ditteologica della Provincia di Pavia. Part II. *Bollett. della Soc. Ent. Italiana*. Anno 24. Firenze, 1892.
- BIGNANI. Vide Grassi, Bignani and Bastianella.

\* This bibliography is by no means complete. There are sure to be many isolated articles in "Journals" that I have not been able, in the time at my command, to consult.

- BIGNANI e BASTIANELLI. Sulla coltivazione del parassito della terzana primaverile nell' "Anopheles claviger." R. Acc.
- BIGOT, J. *Bulletin, Société Ento. France.* IX., p. 122.
- BIGOT, J. Catalogue of Oriental Diptera. Part I. (Culicidae to Cyrtidae), pp. 250-282. (J. A. S. B. ix.)
- BIGOT, J. Expédition Scientif. de la Tunisie. Diptera, p. 7.
- BIGOT, J. Trois Diptères nouveaux de la Corse. *Annales de la Société Entomologique de France.* S. 4. Tom. 1. Paris, 1861. (*Culex vittatus*, &c.)
- BLANCHARD. *C. pipiens* larva as an internal parasite. *Bull. Soc. Zool. France.* XVI., p. 72.
- BLANCHARD, E. De la composition de la bouche dans les Insectes de l'ordre des Diptères. *Comp. Rend. Ac. Sc. Paris.* Tab. 31. 1850.
- BLANCHARD, E. Histoire naturelle des insectes, leurs mœurs, leurs métamorphoses et leur classification. Paris, 1845.
- BLANCHARD, E. Métamorphoses, mœurs et instincts des Insectes. Paris, 1868.
- BONANNI, P. *Micrographia curiosa.* MDCXCI. Pars II. Tab. I. Rome (figures of larva and pupa of *Culex*). 1691.
- BRAUER, F. Die Zweiflügler des Kaiserlichen Museums zu Wien. III. Systematische Studien auf Grundlage der Dipteren-Larven, &c. *Denkschriften d. math. Naturw. Cl. d. Kais. Akad. d. Wiss.* Vol. 47, pp. 1-96. 1883.
- BRULLÉ, A. Expédition Scientifique de Morée. Section des Sc. phys. Tom. III. Part. I. Deuxième Section: Les animaux articulés, IV. Classe: Insectes. Paris, 1832. (*Culex kounoupi*.)
- BURMEISTER. Reise durch die La Plata Staaten. 1865.
- CAMPBELL, A. M. Remedies against Sand Flies and Mosquitoes. *Insect Life*, III., 470. 1891.
- CARPENTER. Gnats. *Cyclopedia of Natural Science.* London, 1843.
- CELLI, A. La malaria secondo le nuove ricerche. Roma, Agosto, 1899.
- CELLI e CASAGRANDE. Sulla coltivazione della zanzara, contributo allo studio delle sostanze zanzaricide. Roma, 1899.
- CHILD, CH. Ein bisher wenig beachtetes antennales Sinnesorgan der Insekten, mit besonderer Berücksichtigung der Culiciden und Chironomiden. *Zeitschr. f. Wiss. Zoologie.* Bd. 58, 3. Leipsic, 1894.
- CHRISTOPHERS, S. K., and STEPHENS, J. W. W. Further Reports to the Malarial Committee of the Royal Society. The Native as the Prime Agent in the Infection of Europeans. Royal Society, Aug. 15th, 1900.
- COMBES, P. Les moustiques de l'Île d'Anticosté. *Revue Scientifique*, 12th Dec. pp. 751-753. Paris, 1896.
- COQUEBERT. *Illustratio iconographica Insectorum quae in Museo Parisinis observavit.* Paris, 1792-1804.
- COQUILLETT, D. W. *Canadian Entomologist*, p. 43, &c. XXVIII. 1896.
- COQUILLETT, D. W. Report on a collection of Japanese Diptera. *Proceedings U. S. National Museum.* Vol. XXI., pp. 301-303. Washington, 1899. (*C. pallens* and *C. subalbatus*.)
- COUR, DE LA, J. L. The Mosquito (*Culex*). *American Monthly Micro. Journal.* Vol. 5. 1884.
- CURTIS, J. A Guide to the arrangement of British Insects, &c. London, 1829, and 2nd ed., 1837.

- GURTIS, J. British Entomology. (Vol. XI., 1834.) 1823-1840. London.  
(*Culex guttatus*.)
- DANCER, J. B. Protection against Mosquitoes. *Nature*. XII., p. 338.  
1880.
- DANIELS, C. W. On Transmission of Proteosoma to Birds by Mosquitoes.  
Reports to the Malarial Committee of the Royal Society. 1899-1900,  
pp. 1-11. July, 1900.
- DANIELS, C. W. Reports from East Africa. Reports to the Malarial  
Committee of the Royal Society. 3rd Series. Dec. 31st, 1900, pp.  
25-45.
- DARUTY DE GRANDPRÉ, A. Culicidae in Mauritius. *Annual Report of*  
*Museum, Colony of Mauritius*. 1898-1899, p. 4.
- DE GEER, C. Mémoires pour servir à l'histoire des Insectes. T. VI.  
Stockholm, 1776.
- DELBŒUF, J. La destruction des Moustiques. *Revue Scient.* IV., 4 s.,  
p. 729. Paris, 1895.
- DIMMOCK, G. Anatomy of the Mouth Parts of the Suctorial Apparatus of  
*Culex*. *Psyche*, pp. 231-241. 1881.
- DIMMOCK, G. Male *Culex* drinking. *Psyche*. Vol. 4. No. 119. Cam-  
bridge, U.S.A., 1884.
- DIMMOCK, G. The Anatomy of the Mouth Parts and of the Sucking  
Apparatus of some Diptera. Boston, 1881.
- DOLESCHALL. Natuurkundig Tijdschrift voor Nederlandsch Indië. X.,  
XIV. and XVII.
- DONITZ, W. Ueber Stechmücken. *Insekten Borse*. XVIII. Jahrgang,  
p. 34. (1901).
- DONITZ, W. *Nach. Berlin. Entomol. Verein* (Sitz. v. 17. Januar 1901),  
in *Insekten Borse*. XVIII., pp. 36 to 38. (New *Anopheles* and *Culex*).
- DUMÉRIL, C. Cousin. *Dictionnaire des Sciences Naturelles*. Levrault  
ed., Tome onzième. Strasbourg et Paris, 1818.
- DUMÉRIL, C. Sur les Diptères. Strasbourg, 1819.
- DURKEE, S. On the Sting of *Culex pipiens*. *Proc. Boston Society of*  
*Natural History*. Vol. 5. 1855.
- EATON, A. Eucalyptus versus Mosquitoes. *Insect Life*. V., p. 268.
- EATON, A. Proceedings Entomological Soc. London, 1878. (Kunga  
cake made from *Corethra* larvae, Lake Nyassa.)
- ERICHSON. *Archiv. für Naturg.* VIII., p. 270. 1842.
- FABRICIUS, J. C. *Entomologia systematica emendata et aucta, &c.*  
Hafniae, 1792-1794.
- FABRICIUS, J. C. *Genera Insectorum*. Kilonii, 1777.
- FABRICIUS, J. C. *Mantissa Insectorum, sistens eorum species nuper*  
*detectas, adiectis characteribus genericis, differentiis specificis, emenda-*  
*tionibus, observationibus*. Hafniae, 1787.
- FABRICIUS, J. C. *Species Insectorum, exhibentes eorum differentias,*  
*specificas, synonyma auctorum, loca natalia, metamorphosin, adiectis*  
*observationibus, descriptionibus*. Hamburgi et Kilonii. T. 1 and 11.  
1781.
- FABRICIUS, J. C. *Systema entomologiae, sistens Insectorum classes,*  
*ordines, genera, species, &c.* Flensburgi et Lipsiae. 1775.
- FALLEN, C. F. *Diptera Sueciae descripta*. Lundae, 1814-27.

FICALBI, E. Notizie p. sulle zanzare italiane:—

I. Nota. Alcune genitalità. Descrizione di una specie nuova (*Culex hortensis*).

II. Nota. Descrizione di una specie nuova (*Culex Richiardi*). 1889.

III. Nota. Il *Culex spathipalpis*. 1889.

IV. Nota. Descrizione di una specie nuova (*C. modestus*). 1889.

V. Nota. Descrizione di una specie nuova (*Culex elegans*). 1889.

VI. Nota. Quistioni zoologiche intorno al *Culex pipiens* e descrizione di una specie nuova (*Culex phytophagus*). 1890.

VII. Nota. Descrizione di una specie nuova (*Culex impudicus*). 1890.

VIII. Nota. *Culex penicillaris*. 1896.

IX. Nota. *Culex salinus*. 1896.

In *Bullett. della Soc. Entomol. Italiana*. XXI., 1889-90, and XXII., 1890. Florence.

FICALBI, E. Revisione sistematica d. fam. delle *Culicidae* Europee. Florence, 1896.

FICALBI, E. Sul preteso parasitismo della larva di *Culex pipiens*. *Monit. Zool. Italiano*. 1890.

FICALBI, E. Venti Specie di Zanzare (*Culicidae*) Italiane. Firenze, 1899. Reprinted from *Bullett. della Soc. Entomol. Italiana*. Anno XXXI. 1899.

FIELDING-OWLE, R. Observations at Freetown, Accra, Lagos. *Liverpool School of Medicine*. Memoir II., pp. 51-58. 1900.

FINLAY and DELGRADO. Colonias de tetrágeños sembradas por Mosquitos. *Ann. r. Acad. de. cien. Med. de la Habana*. XXIV., pp. 205-210. pl. i. 1887-1888.

FISCHER, G. Observations sur quelques diptères de la Russie. Notice sur la larve de *Culex clariger* de Fabricius. *Mém. Soc. Impériale Nat. Moscou*. IV., pp. 167-180. 1812-1812.

FRAUENFELD, Verhand. Zool. Bot. Ges. Wien. XVII., p. 451, &c. 1867. (*Culex conopas*.)

GADEAU DE KERVILLE, N. Les Insectes phosphorescents. Rouen, 1882.

GARDENER'S CHRONICLE. XXII. (2), pp. 171, 172. Habits of Mosquitoes.

GEER, DE. *Vide* De Geer.

GELIM, J. B. Phosphorescence sur le Cousin *Culex pipiens*, L. *Boll. de la Soc. d'hist. Nat. du départ. de la Moselle*. 10 cah. 1866.

GEOFFROY. Histoire abrégée des Insectes des environs de Paris. Paris, 1762.

GEOFFROY. *Hist. Nat. Ins.* 1764.

GERMAR, E. F. Reise nach Dalmation und in das Gebiet von Ragusa. Leipzig, 1817. (*Culex domesticus*.)

GIESFELDT. On Mosquitoes at Loango. Loango Expedition. III. Part II., pp. 295, 296.

GILES, G. M. A Handbook of Gnats or Mosquitoes. London, 1900.

GILES, G. M. Description of two *Anopheles* from West Africa. *Liverpool School of Tropical Medicine*. Memoir II., pp. 49-51.

GILES, G. M. *Journal of Tropical Medicine*. Oct. 1899.

GILES, G. M. Notes on Collecting and Preserving Mosquitoes. Hamed Press, Shabjahanpur, 1900.

GILES, G. M. Six new species of *Culicidae* from India. *Entomologist*, p. 192. 1901.

GIMMERTHAL. *Bull. Soc. Imp. des aNaturalistes de Moscou*. XVIII. 1845.

- GIMMERTHAL, B. A. Erster Beitrag zu einer künftigt zu bearbeitenden Dipterologie Russlands. *Bull. de la Soc. Impér. des Naturalistes de Moscou*, 1845. T. XVIII. Moscou, 1845.
- GIRARD, M. Les Insectes. Traité élém. d'Entomologie. T. III. Paris, 1885.
- GMELIN, J. F. Systema Naturae. Ed. XIII. II., p. 2026, &c. Lipsiae, 1788-93.
- GODEHEU DE RIVILLE. Mémoire sur l'accouplement des Cousins. *Mém. de Math. et de Phys. de l'Ac. Roy. des Sc.* T. III. Paris, 1760.
- GOUREAU, C. Les Insectes nuisibles à l'homme, aux animaux et à l'économie domestique. Paris, 1866.
- GRASSI, B. Rapporti tra Malaria e peculiari insetti (zanzaroni e zanzare palustri). *Atti della R. Acc. dei Lincei, Rendiconti della A. di Sc. fisiche*. Vol. VII. Roma.; Le recenti scoperte sulla Malaria esposte in forma popolare. *Rivista de Sc. biologiche*. I. Fasc. 7. Milano, 1899; La Malaria propagata per mezzo di peculiari insetti. *Rendic. R. Acc. Lincei, Cl. di Sc. fisiche*. 2° Vol. VII. Roma, 1878; Rapporti tra la Malaria e gli arteopodi. *Rend. R. Acc. Lincei*. Sem. II., vol. VII., fasc. 11. Roma, 1898; Ancora sulla Malaria. *Rend. R. Acc. Lincei*. Sem. I., vol. VIII., fasc. 12. Roma, 1899.
- GRASSI, BIGNANI and BASTIANELLI. Coltivazione delle semilune malariche dell' uomo nell' "Anopheles claviger." *Rend. R. Acc. Lincei*. II., Vol. VII. Roma, 1898; et Vol. VIII., fasc. 1. 1899.
- GRAY, ST. GEORGE. Anopheles in St. Lucia. *British Medical Journal*. Vol. II., pp. 583, 584. London, 1900.
- GRAY, ST. GEORGE. What becomes of Mosquitoes during the dry season? *Journal of Tropical Medicine*. Vol. II., p. 250. London, 1900.
- GUÉRIN et PERCHERON. Généra des insectes ou exposition détaillée de tous les caractères propres à chacun des genres de cette classe d'animaux. Paris, 1835-38.
- HALIDAY, A. H. Descriptions of new British Insects. *Ann. of Nat. Hist. or Magaz. of Zool., Bot., and Geol.* V. 2. London, 1839.
- HALIDAY, A. H. *Entomological Magazine*. I., p. 151. London, 1833. (*Culex detritus*.)
- HOGG, J. On Gnats' Scales. *Monthly Microscopical Journal*. Vol. 6. 1871.
- HOLMBERG, E. L. Viaje á Misiones. Buenos Aires, Coni, 1887-89.
- HOPKINS, A. D. Bull. 17. New Series. U. S. Dept. Agriculture. Division Entomology.
- HOWARD, L. O. An Experiment against Mosquitoes. *Insect Life*. V., pp. 12-14, 109-110, 199. 1893; and VI., pp. 90-91. 1894.
- HOWARD, L. O. How to distinguish between the different Mosquitoes of North America. Circular No. 40. 2nd Sc. U. S. Dept. Agriculture. Washington, 1900.
- HOWARD, L. O. Insects affecting domestic animals. *Bulletin*. No. 5. N. S. U. S. Dept. Agriculture. Division Entomology. 1896.
- HOWARD, L. O. The Mosquitoes of the United States. Bull. 25. New Series. U. S. Dept. Agriculture. Division Entomology. Washington, 1900.
- HOWARD, L. O. The Principal Household Insects of the United States. \* Chap. I. Mosquitoes and Fleas. Bull. 4. New Series. U. S. Dept. Agriculture. Washington, 1899.
- HOWARD, L. O. Mosquitoes; how they live; how they carry disease, &c. New York, 1901.
- HUDSON. Manual of New Zealand Entomology. Wellington, 1896.



- HURST. The Pupal stage of *Culex*. Manchester, 1890.
- HURST, C. H. On the life-history and development of a Gnat (*Culex*). *Trans. of the Manchester Micro. Soc.* 1890.
- HURST, C. H. The Postembryonic Development of a Gnat, *Culex*. *Proceed. of the Liverpool Biological Soc.* 1890.
- HUMBOLDT, A. VON. Beiträge zur Naturgeschichte der Mosquitos. Fororierp Notizen. III. 1822.
- JAMES, S. P. On the Metamorphosis of *Filaria sanguinis-hominis* in Mosquitoes, especially with regard to its Metamorphosis in *Anopheles Rossii*, and other mosquitoes of the *Anopheles* genus. *British Medical Journal*. Vol. II. Sept. 1, 1900; *Indian Medical Gazette*. Vol. XXXV., pp. 169-171 and 340-343. 1900.
- JAMES, S. P. The Collection of Mosquitoes and their larvae. *Indian Medical Gazette*. Vol. XXXIV. No. 12. Dec. 1889.
- JOHNSTON, C. Auditory apparatus of *Culex* mosquito. *Quarterly Journal of Microscopic Science*. Vol. 3. 1855.
- JOURDAIN, S. Note sur un mouvement de rotation singulier de la tête chez une larve de Culicide. *Compt. rendu. Soc. Biol. de Paris*. V. 1895.
- KARSCH. Ent. Nachr., p. 25. 1887.
- KAWN, M. Iron Nails in Water-vessels to prevent Mosquito Development. *Scientific American*. Sept. 1893.
- KEAST, J. Mosquitoes. *Science-Gossip*. London, 1867-68.
- KING, A. F. A. Insects and Disease, Mosquitoes and Malaria. *Popular Science Monthly*. Sept. 1883. XXIII., pp. 644-658. New York.
- KIRBY and SPENCE. An Introduction to Entomology. Vol. I.
- KOLLAR, V. Brasilien's vorzüglich lästige Insekten. Wien, 1892.
- KOLLAR, V. Naturgeschichte der Gelse oder Mücke *Culex pipiens*. Wien. Zeitschr. f. Kunst, Litt., Theater und Mode. 1890.
- LACORDAIRE, T. Introduction à l'Entomologie, comprenant les principes généraux de l'anatomie et de la physiologie des insectes, &c. Impr. et fond. de Tain Roret. Paris, 1834-38.
- LAMBORN, R. H. Dragon Flies versus Mosquitoes. Can the Mosquito Pest be Mitigated? Studies in the Life-history of Irritating Insects, their Natural Enemies and Artificial Checks. By Working Entomologists, with Introduction by R. H. Lamborn, Ph.D., New York, including the Lamborn Prize Essays. pp. 179. 9 plates. 1890.
- AARON, C. B. The Dipterous Enemies of Man. Their Life-history and Structure, pp. 25-68.
- BEUTENMÜLLER, W. Essay on the Destruction of the Mosquito and Horsefly, pp. 99-127.
- MACAULAY, C. N. B. Dragon Flies as Mosquito Hawks on the Western Plains, pp. 131-134.
- MCCOOK, H. C. Can the Mosquito be Exterminated? pp. 137-147.
- WEEKS, A. C. Utility of Dragon Flies as Destroyers of Mosquitoes, pp. 71-95.
- LANKESTER, E. R. On the Microscopic Anatomy of an Insect Larva, *Corethra plumicornis*. *Popul. Sc. Rev.* Vol. 4. 1864.
- LATREILLE, P. A. Familles naturelles du Règne animal. Paris, 1825.
- LATREILLE, P. A. Genera Crustaceorum et Insectorum secundum ordinem naturalem in familias deposita. Paris, 1806-9.
- LATREILLE, P. A. Histoire naturelle des Crustacées et des Insectes : ouvrage faisant suite aux œuvres de Leclerc, de Buffon et partie du Cours complet d'Histoire Naturelle rédigé par C. S. Sonnini. Paris, 1802-5.

- LATREILLE, P. A. Recueil d'observations de zoologie et d'anatomie comparée faites dans un voyage aux tropiques (par MM. Humboldt et Bonpland) dans les années 1799-1804. Paris, 1811-1832.
- LEACH, W. E. Description of thirteen species of *Formica* and three species of *Culex*, found in the environs of Nice. *Zoological Journal*. VII. London, Oct. 1825.
- LEMBERT, J. B. Kerosene against Mosquitoes. *Insect Life*. VI., p. 327. 1894.
- LESNE, P. Expériences en vue de la destruction des Cousins, *Culex pipiens*. *Ann. Soc. Ent. de France*. T. 16. Paris, 1891.
- LEWIS. *Proceedings Asiatic Soc. Bengal*, pp. 89-93. 1878.
- LEYDIG, F. Anatomisches und Histologisches über die Larve von *Corethra plumicornis*. *Zeitschr. für Wiss. Zool*. 1851.
- LOES, H. Beschreibungen europäischen Dipteren. Dritter Bd. Halle, 1873.
- LOEW, H. *Dipterologische Beiträge*. Posen, 1845.
- LOEW, H. *Entomo. Zeitschr.*, p. 55. 1866.
- LINNAEI, C. *Fauna Suecica*. Ed. altera. Stockholm, 1761.
- LINNAEI, C. *Fauna Suecica*. *Lugduni Batavorum*, 1746.
- LINNAEI, C. *Systema Naturae*, &c. Ed. 1. *Lugduni Batavorum*, 1735. Ed. 10, reformata. *Holmiae*, 1758. Ed. 12, reformata. *Holmiae*, 1766-68.
- LINTNER, J. A. *Reports of the Injurious and other Insects of the State of New York*. Abundance of Mosquitoes in Southern United States. I., 14 and 78; 2, 112; 4, 133; 5, 319. The Mosquito (a paper read before the Dana Nat. Hist. Soc. of Albany, 1887). General Account of Mosquitoes. 12, pp. 319-335. 1897.
- LIOY, P. *Ditteri Italiani*. Milan, 1895.
- LOW, G. C. *Filaria nocturna* in *Culex*; probable mode of infection of man. *Journal Tropical Medicine*. Vol. II., pp. 312, 313. 1900.
- LUGGER, OTTO. Report Minnesota State Agricultural Experiment Station, pp. 216, 217. 1896. (Number of Mosquitoes which may breed in a rain barrel.)
- MACDONALD, IAN. Mosquitoes in relation to Malaria. *British Medical Journal*. Vol. II., p. 699. 1899.
- MACGREGOR, SIR WILLIAM. Malaria and the Destruction of Mosquitoes. An Address on some Problems of Tropical Medicine. (Part of.) *Journal Tropical Medicine*. London, Oct. 1900.
- MACKLOSKIE, G. The poison apparatus of the Mosquito. *American Naturalist*. XXII. Philadelphia, 1888.
- MACQUART. Diptères exotiques (Ins. Dipt.), nouveaux ou peu connus. Paris, 1838-50, et sup. 5. *Mémoires de la Société impériale des Sciences, de l'Agriculture et des Arts de Lille*. Lille, 1854.
- MACQUART. Histoire Naturelle des insectes Diptères. Paris, 1833-1838.
- MACQUART. Insectes Diptères du Nord de la France. *Mém. de la Société Royale des Sciences, de l'Agriculture et des Arts de Lille*. Lille, 1825-1828.
- \*MAGIS. Feüilles des jeunes Naturalistes. XIV. Paris, 1884.
- MANSON, PATRICK. Metamorphosis of *Filaria sanguinis-hominis*. *Transactions Linnean Society*. 2nd Se., Zool. Vol. II. Part X. London, 1884.

- MANSON, PATRICK. On the life-history of the Malarial Germ outside the human body. *Lancet*. Vol. I., pp. 751-754, and 881-888. 1896.
- MANSON, PATRICK. On the development of *Filaria sanguinis-hominis*, and on the Mosquito considered as a "Nurse." *Linnean Society*, March, 1878; *Medical Reports*, China Customs, No. 14. 1878; *Transactions of Pathological Society*. XXXII. 1881; *Journal Linnean Society*. XIV. 1879.
- MANSON, PATRICK. Surgeon-Major Ronald Ross's Recent Investigation on the Mosquito-Malaria Theory. *British Medical Journal*. pp. 1575-1577. 1898.
- MANSON, PATRICK. The Development of *Filaria sanguinis-hominis*. *Medical Times and Gazette*. Vol. II., p. 781. London, 1878.
- MANSON, PATRICK. The Mosquito and the Malaria Parasite. *British Medical Journal*. pp. 849-853. 1898.
- MAYER, A. M. Experiments on the supposed Auditory Apparatus of the *Culex* mosquito. *Ann. Mag. Nat. Hist.* 4th Se. Vol. 15. 1875; and *American Naturalist*. Vol. 8. 1875.
- MEIGEN, J. W. Klassifikation und Beschreibung der Europäischen Zweiflügeligen Insekten. Erster Bd. Braunschweig, 1804.
- MEIGEN, J. W. Syst. Beschreibung der bekannten Europ. Zweiflügeligen Insekten. Th. 1-7. Aachen-Hamm, 1818-1838.
- MEINERT, F. De Encephale Myggelarver. Sur les larves encéphales des Diptères; leurs mœurs et leurs métamorphoses. K. Danske viden-skabernes Selskabs Skrifter. III., pp. 373-493. Copenhagen, 1886.
- MEINERT, FR. Fluernes Munddele. Trophi Dipterorum. Med. 6. Kobbertavler. Kjöbenhavn, 1881.
- MEINERT, J. Die Mundtheile der Dipteren. *Zoolog. Anzeiger. Jahrg.* V. Leipzig, 1882.
- MIALLE, L. C. The Natural History of Aquatic Insects. London, 1895.
- MILTON, J. L. Mosquitoes. *Science-Gossip*. London, 1869.
- MOFFAT, J. A. Mosquitoes. *Twenty-fourth Annual Report of Entomolog. Society of Ontario*, p. 43 for 1893. Toronto, 1894.
- MORENOS, D. LEVI. Food of the larvae of Insects (Culicidae). *Neptunia*. 1891.
- MOTT, F. F. A Festival of Gnats. *Midland Naturalist*. Vol. 2. 1879.
- MOYANO, C. M. Exploracion de los rios Gallegos, Corle, Santa Cruz y canales del Pacifico. (Patagonia austral.) Buenos Ayres, *Tribuna Nacional*, 1887.
- MUIR, W. The Head and Sucking Apparatus of the Mosquito. *Canadian Naturalist and Quart. Journal of Science*. 2 S. X. Montreal, 1883.
- MÜLLER, O. F. Zoologiae Danicae Prodrömus. Hafniae, 1776.
- MURPHY, E. The Proboscis and Sucking Apparatus of the Mosquito, genus *Culex*. *Quart. Journ. of Science*. 2 S. X. Montreal, 1883.
- MURRAY, C. H. Young Trout destroyed by *Culex*. *Proceedings Entomological Society*. p. xxv. London, 1885; and *U. S. A. Fish Commission Bulletins*, p. 248. 1885.
- NEUHAUS, G. H. *Diptera Marchica*. Syst. Verzeichn. der Zweiflügler. Berlin, 1896.
- NOÈ, G. Contribuzione allo studio dei Culicidi. *Boll. della Soc. Ent. Italiana*. XXXI. Firenze, 1899.

- NUTTALL, G. H. F., COBBETT, L., and STRANGEWAYS-PIGG, T. Studies in Relation to Malaria. 1. The Geographical Distribution of Anopheles in relation to the former Distribution of Ague in England. *Journal of Hygiene*. Vol. 1. No. 1, and reprint. Cambridge, 1901.
- NUTTALL, G. H. F. Die Mosquito-Malaria Theorie. *Centralbl. f. Bakteriologie*. Vol. XXV., pp. 112-170, 209-216, 245-247, 285-296, 337-346.
- NUTTALL, G. H. F. Filariasis. Reprint from *Encyclopaedia Medica*. Vol. III.
- NUTTALL, G. H. F. Neuere Forschungen über die Rolle des Mosquitos bei der Verbreitung der Malaria. Zusammenfassendes Referat. *Centralbl. f. Bakteriologie*. Vol. XXVI., pp. 140-147, and Vol. XXVII., pp. 198-196, 218-225, 260-264, 328-340.
- NUTTALL, G. H. F. On the Rôle of Insects, Arachnids, &c., as carriers in the spread of Bacterial and Parasitic Diseases of Man and Animals. A Critical and Historical Study. Johns Hopkins' Hospital Reports. Vol. VIII. Reprint. Baltimore, 1899.
- NUTTALL, G. H. F. The Part played by Insects, Arachnids, &c., in the propagation of infective diseases of man and animals. *British Medical Journal*. Sept. 9, 1899.
- NUTTALL, G. H. F., and SHIPLEY, A. E. Studies in relation to Malaria. II. The Structure and Biology of Anopheles (*A. maculipennis*). The Egg and Larva. *Journal of Hygiene*. Vol. 1. No. 1. Cambridge, 1901.
- OLIVIER, Cousin, *Culex*. *Histoire Naturelle des Insectes*. T. sixième. Paris, 1791.
- OSBORN, H. Insects affecting domestic Animals. *Bull.* 5. N. Se. U. S. Dept. Agriculture. (Division Entomology.) 1896.
- OSTEN-SACKEN, C. R. *Biologia Centrale Americana: Diptera*.
- OSTEN-SACKEN, C. R. *Bulletin U. S. Geological Survey*. III., p. 191. (*Aedes fuscus*.) Washington, 1877.
- OSTEN-SACKEN, C. R. Catalogue of North American Diptera. Washington, 1878.
- OSTEN-SACKEN, C. R. Facts concerning the Importation or non-Importation of Diptera into distant Countries. *Trans. Ent. Soc.* Lond. 1884.
- OSTEN-SACKEN, C. R. On the characters of the three divisions of Diptera: *Nemocera vera*, *Anomala*, and *Eremochaeta*. *Berliner Entomol. Zeitschrift*. Bd. XXVII. Berlin, 1892.
- OSTEN-SACKEN, C. R. Transactions American Entomological Society. Vol. II., p. 47. 1868.
- Notice on Synonymy of *A. Maculipennis*. *Ento. Mo. Mag.*, p. 231. 1900. Vol. XI., Sec. Se.
- PAGENSTECHER, A. Ueber d. Schnacke (*Culex pipiens*). *Fühling's Jdw. Ztg.* XXIII. Jhg. 1874.
- PALLAS, P. S. Kleine Notizen in den Neuen Nordischen Beiträgen. T. IV. 1782. (*Lampyrus* and *Culex*.)
- PALLAS, P. S. Reisen durch Veisch des Russisch. Reichs. (*Culex caspius*.) Petersburg, 1771-73-76.
- PANZER. *Fauna Germanica*.
- PHILIPPI, R. A. Aufzählung der chilenischen Dipteren. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft. XV. Wien, 1865.

- PIFFARD, A. Abundance of *Culex dorsalis* at Aldeburgh. *Ent. Mo. Mag.* 6. London, 1895.
- PORTSCHINSKY. Horae Soc. Ent. Rossicae, p. 122. 1883-1884.
- POUCHET, F. A. Sur l'appareil digestif du *Culex pipiens*. *Compt. Rend. d. l'Acad. Sc.* T. 25. Paris, 1847.
- RASCHKE, W. Die Larvae von *Culex nemorosus*. *Archiv. für Naturgeschichte.* S. 2. Berlin, 1887.
- RASCHKE, W. Zur Anatomie und Histologie der Larve von *Culex nemorosus*. *Zoolog. Anzeiger.* X. Leipzig, 1887.
- REES, D. C. Experimental Proof of the Mosquito-Malaria Theory. *British Medical Journal.* Vol. II., p. 1054. London, 1900.
- RISSO, A. Histoire Naturelle des principales productions de l'Europe méridionale, &c. T. V. Paris, 1826.
- ROBINEAU DESVOIDY, J. B. Essai sur la tribu des Culicides. *Mém. de la Soc. d'Hist. Nat. de Paris.* T. troisième, III<sup>e</sup> livraison. Paris, 1827.
- RÜDER, VON. *Entomologische Zeitung*, p. 835, &c. Stetin, 1885.
- ROFFREDI, MAUR. Mémoire sur la trompe du Cousin et sur celle du Taon, dans lequel on donne une description nouvelle de plusieurs de leurs parties, avec des remarques sur leur usage, principalement par la suction. *Miscellanea taurinensia. Mélanges de Philos. et de Math. de la Soc. Roy. de Turin.* T. 4. 1766-1769.
- RONDANI, C. Dipterologiae Italicae Prodromus. Vol. I. Parmae, 1856.
- RONDANI, C. Essame di varie specie di insetti Ditteri Brasiliani in Brandi et Fruqui. *Studi Entomologici.* Torino, 1848.
- RONDANI, C. Sulla specie Italiana d. gen. *Culex*. *Boll. della Soc. Entom. Italiana.* IV. Firenze, 1872.
- ROSS, RONALD, ANNETT, H. E., and AUSTEN, E. E. Report of the Malaria Expedition of the Liverpool School of Tropical Medicine and Medical Parasitology. *Liverpool School of Tropical Medicine.* Memoir II. 47 pp. 1900.
- ROSS, RONALD. Du Rôle des Moustiques dans le Paludisme. *Extrait des Annales de l'institut Pasteur.* Reprint. 1898.
- ROSS, RONALD. Infection of Birds with Proteosoma by the bites of Mosquitoes. *Indian Medical Gazette.* Vol. XXXIV. No. 1. Jan. 1899.
- ROSS, RONALD. Instructions for the Prevention of Malarial Fever. *Liverpool School Tropical Medicine.* Mem. 1. 1900.
- ROSS, RONALD. Malaria and Mosquitoes. Abstract of a discourse delivered before the Royal Institute of Great Britain. London and Liverpool, March, 1900.
- ROSS, RONALD. Malarial Fever. *Medical Annual.* 1900.
- ROSS, RONALD. Report on the Cultivation of Proteosoma Labbé in grey Mosquitoes. *Indian Medical Gazette.* Vol. XXXIII. No. 12. Dec. 1898.
- ROSS, RONALD. The Relationship of Malaria and the Mosquito. *Lancet.* Vol. II., pp. 48 to 50. London, 1900.
- ROSSI, P. Fauna Etrusca. T. II. Liburni, 1790.
- RUSSELL, C. H. The Best Mosquito Remedy. *Insect Life.* III., p. 223. 1891.
- SAMBON, L. W., and LOW, G. On the resting position of Anopheles. *British Medical Journal.* Vol. II., p. 1158. 1900.

- SANDERS, W. A. *Eucalyptus versus Mosquitoes*. *New York Medical Journal*, pp. 255-256. Sept. 1893.
- SAY, THOMAS. Description d'insectes de l'ordre des Diptères des États-Unis. *Journal of Academy of Natural Sciences of Philadelphia*. 1822.
- SAY, THOMAS. Long's Expedition to St. Peter's River. II. Appendix, p. 356.
- SAY, THOMAS. Thomas Say's complete writings, by Leconte, 1859.
- SCHEER, VAN DER, A., and BERDENIS VAN BERLEKOM. Malaria en Musketien in Zeeland. *Ned. Tijdschrift voor Geneeskunde*. Vol. II. No. 14. 1900.
- SCHINER, J. R. *Catalogus Systematicus Europaeae*. Vindobonae, 1864.
- SCHINER, J. R. *Diptera. Reise der Ost. Fregatte Novara, Zool. Theil. Zweiter. Bd. 1. Abth. 13*. Wien, 1868.
- SCHINER, J. R. *Fauna Austriaca. Die Fliegen. II*. Wien, 1864.
- SCHINER, J. R. *Novara Expedition. Zoologischer Theil: Diptera. Bearbeitet von Dr. J. R. Schiner*. Wien, 1868.
- SCHÖMBAUER, J. A. *Geschichte des schädlichen Kolumbatzer Mücken in Bannat*. Wien, 1795.
- SCHRANK, F. v. PAULA. *Beiträge zur Naturgeschichte*. Augsburg, 1776. (*C. annulatus*.)
- SCHRANK, F. v. PAULA. *Enumeratio Insectorum Austriae indigenorum*. Augustae Vind., 1781.
- SCHRANK, F. v. PAULA. *Fauna boica*. 1 Bd. Nürnberg, 1798.
- SCOPOLI, G. ANT. *Entomologia Carniolica, exhibens insecta Carnioliae indigena*. Vindobonae, 1763.
- SIEBKE, H. *Enumeratio insectorum Norvegorum*. Fasc. IV., *Catalogum Dipteriorum Contin. Op. post. ed. A. Schneider*. Christiania, 1877.
- SKUSE, F. A. A. *Diptera of Australia. Part V. Culicidae. Proceedings of the Linnean Society of N. S. Wales*. 2nd Se. Vol. III., pp. 1717 to 1764. Sydney, 1889.
- SKUSE, F. A. A. *Indian Museum Notes. III*. Calcutta.
- SLABBER. *Culex pipiens oder Wurm von der Singschnacke. Physikalische Belustigungen oder Mikroskopische Wahrnehmungen, &c*. Nürnberg, 1781.
- SLATER, J. W. An alleged instinct of Mosquitoes. *Entomologist*. Vol. 12. London, 1879.
- SPENCE. *Vide Kirby and Spence*.
- STAEGER. *Naturhistorisk Tidskrift (Kjöyer)*. Bd. II. Kjöbenhavn, 1889.
- STEBBINS, F. B. Mosquitoes and Malaria. *Popular Science Monthly*. XXIV., pp. 700-701. 1884.
- STEPHENS, J. F. A Systematic Catalogue of British Insects. London, 1829.
- STEPHENS, J. F. Some observations on the British Tipulidae, with descriptions of the species of *Culex* and *Anopheles* found in Britain. *Zoological Journal*. N. IV. London, Jan. 1821.
- STEPHENS, J. F. *Zoological Journal*. N. XII. (Descriptions of *A. griseus*.) London, 1823.
- STEPHENS, J. W., and CHRISTOPHERS, S. R. Reports to the Malarial Committee of the Royal Society, 1899-1900. The Distribution of *Anopheles* in Sierra Leone. Parts I. and II. London, 1900.

- STEPHENS, J. W. W., and CHRISTOPHERS, S. R. Reports from the West Coast of Africa. Reports to the Malarial Committee of the Royal Society. 3rd Se. pp. 1 to 24. London, Dec. 31, 1900.
- STERLING, E. Mosquitoes in Boreal Latitudes. *Insect Life*. III., p. 408. 1891.
- STEWART, H. Insanity caused by Mosquito Bites, and the Hibernation of Mosquitoes. *Insect Life*. V., p. 277. 1892.
- SWINTON, J. Some observations on swarms of Gnats. *Philos. Transactions*. Vol. 57. 1767.
- SYKES, W. Historical Note on the Mosquito Theory of Malarial Infection. *British Medical Journal*, pp. 53-54. 1898.
- THOMSON. Eugen. Resa. Dipt., p. 443.
- THOMSON, J. C. Preliminary Report regarding Research into prevalence of Mosquitoes and Malaria in the Colony of Hong Kong and in the New Territory. *Govern. Notification*. No. 642. Nov. 1900.
- THOMSON, J. C. Report on the results of Dr. Thomson's examinations of the Mosquitoes during 4th quarter of 1900. *Govern. Notification*. No. 17. Jan. 1901. Hong Kong.
- THEOBALD, F. V. A New Anopheles (*A. paludis*) from Sierra Leone. Reports to the Malarial Committee of the Royal Society, 1899-1900, p. 75. July 6, 1900.
- THEOBALD, F. V. Report on the Collections of Mosquitoes (Culicidae) received at the British Museum. British Museum, 1900.
- THEOBALD, F. V. Notes on a collection of Mosquitoes from the West Coast of Africa and descriptions of new species. *Journal of Liverpool School Tropical Med.* 1901.
- THEOBALD, F. V. The Classification of Mosquitoes. *Journal Tropical Medicine*. Vol. IV., pp. 229-235 (1901).
- WADE. Hibernation of Mosquitoes. *Insect Life*. I., p. 52. 1886.
- WAGNER, J. J. De generatione Culicum. *Miscellanea Curiosa, sive Ephem. Med.-Phys. Ac. Nat. Cur. Decuriae*. II. Annus III. 1684. Novimberge, 1685.
- WAHLBERG, P. F. Om stikmyggornas fiender (*Culex*). *Ofvers. K. Vet. Acad. Forhandl.* T. 4. Stockholm, 1847.
- WALCKENAAR, C. A. Faune Parisienne: Insectes; ou Histoire abrégée des Insectes des environs de Paris. T. II. Paris, 1802.
- WALKER, F. Descriptions of Diptera collected by Captain King in the Survey of the Straits of Magellan. *Transactions of Linnean Society* London, 1837.
- WALKER, F. Insecta Saundersiana, or characters of undescribed insects in the collection of W. W. Saunders. London, 1850-56.
- WALKER, F. *Journal of Proceedings of Linnean Society*. I. 1857; III. 1889; IV., p. 91. 1860; V. 1861; et VIII., p. 102.
- WALKER, F. List of species of Dipterous Insects in the collection of the British Museum. Part I. London, 1848.
- WALKER, F. M. Insecta Britannica. Diptera. Vol. III. London, 1886.
- WALKER, F. M. *Science-Gossip*, pp. 79-81. 1867.
- WALKER, F. R. Mosquitoes. *Entomologist*. Vol. 6. London, 1872-73.
- WEED, H. E. Some Experiences with Mosquitoes. *Insect Life*. VII., pp. 212-213. 1895.

- WEISMANN, A. Die Entwicklung der Dipteren. Mit 14 Taf. Leipzig, 1864.
- WEISMANN, A. Die Metamorphose der Corethra. Leipzig, 1866.
- WESTWOOD, J. O. An Introduction to the modern classification of Insects. London, 1839-40.
- WESTWOOD, J. O. *Annales Société Entomo. France.* IV., p. 681. 1835.
- WESTWOOD, J. O. Hibernation of Culex. *Proceedings Entomological Society of London*, p. xxi. 1872; and also p. vii. 1876.
- WESTWOOD, J. O. *Transactions Ent. Society.* III., p. 384. London, 1881.
- WEYENBERGH, H. Los habitantes Vertebrados y Invertebrados del Rio Primero, Montevideo, p. 27. *Insecta, general subject*, p. 11. Montevideo, 1882.
- WEYENBERGH, H. Ueber Fliegenschwärme. *Verh. d. zool.-bot. Ges. in Wien.* 21 Bd. Wien, 1876.
- WIEDEMANN, C. R. W. Aussereuropäische Zweiflügelige Insekten. Hamm, 1828-30.
- WIEDEMANN, C. R. W. *Diptera Exotica. Kiliae.* Part I. 1821.
- WILLIAMS, W. The Destruction of Mosquitoes. *Nature.* Vol. V., p. 44. London, 1892.
- WILLISTON, J. O. Diptera of St. Vincent. *Transactions Ento. Soc.*, p. 271, &c. London, 1896.
- WILLISTON, J. O. North American Fauna. Government Press: Washington, 1893.
- WOODWARD, J. J. On the Markings of the Body-scales of the English Gnat and the American Mosquito. *Monthly Micro. Journal.* Vol. 15. 1876.
- WRIGHT, M. G. The Resistance of the larval Mosquito to cold, and notes on the habits and life-history of Mosquitoes in Aberdeenshire. *Brit. Med. Journ.*, p. 882. (1901).
- WULP, VAN DER, F. M. Bijdragen der Midden Sumatra Expedition. *Diptera.* Deel IV.
- WULP, VAN DER, F. M. *Diptera bij de Noordpool expeditie.* *Tijdschr. Ent.* Bd. 26. 1883.
- WULP, VAN DER, F. M. *Diptera Neerlandica.* Gravenhage, 1877.
- WULP, VAN DER, F. M. Notes from the Leyden Museum. VI.
- WULP, VAN DER, F. M. *Tijdschr. voor Ent.*, p. 129. 1867; et p. 128. 1869.
- YOUNG, J. Hibernation of Mosquitoes. *Science-Gossip.* XVII. London, 1881.
- ZETTERSTEDT, J. W. *Diptera Scandinavica.* Tom. IX. Lundae, 1850.
- ZETTERSTEDT, J. W. *Insecta Lapponica.* Lipsiae, 1840.
- ZIEMANN, H. Ueber die Beziehungen der Mosquitos zu den Malaria-parasiten in Kamerun. *Deutsche Med. Wochenschr.* Jahrg. XXVI. No. 25, p. 399. 1900.





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LONDON :

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED,

DUKE STREET, STAMFORD STREET, S.E., AND 28, GREAT WINDMILL STREET, W.





